Habitat for Humanity®

Affiliate Operating Manual

AOM Construction

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1. Welcome

You have embarked on a life-changing mission. Habitat's construction process combines the ordinary act of building a home with the extraordinary possibilities of human love. This constructive combination renews lives and opens doors for Habitat families and volunteers alike. The construction of simple, decent, healthy Habitat homes testifies to the abilities and determination of the affiliate.

How to use this manual

Home construction remains the most tangible example of the mission of Habitat for Humanity. A wealth of knowledge on this topic exists within Habitat for Humanity International and Habitat affiliates, as well as with our building industry partners.

The purpose of this manual is to give general guidelines on the major areas of the construction process. In its electronic version, the manual is designed to be used with an internet connection for rapid access to recommended resources. Links have been made as short as possible and are spelled. This is a link to the HFHI U.S. Construction Web site on My.Habitat:

http://my.habitat.org/BusinessOperations/USConstruction

This is a link to recommended construction-related resources showcased via the My.Habitat Knowledge Center:

http://my.habitat.org/kc/tags/Construction

Scope

Organizational structures can differ significantly among affiliates — among large and small affiliates; newer affiliates and those with several years of experience; affiliates with and without paid staff.

While this manual is intended for all affiliates, new or smaller affiliates should find the content of particular value. In addition, this manual may be very useful for new Habitat staff, board of directors or committee members — whether joining large or small affiliates — who are less familiar with the construction process.

Habitat affiliates that have several years of experience may have developed individual construction manuals that have been tailored to their size, production level, climate region and geographic area. Those manuals provide an additional resource for the affiliate. No manual can provide a specific answer for every potential construction circumstance. Use this manual for general guidance, then look to your other resources for information and help in dealing with special and unique situations.

This manual also cross references relevant HFHI policies, all of which can be found in Exhibit G of the U.S. Affiliated Organization Policy Handbook.

"How to Build a House" reference manual

Although this manual covers many of the general tasks associated with the construction process, it is not a "how to" manual. For specific instructions on each step of the house construction process, we suggest that you consult the Habitat for Humanity "How to Build a Better House" manual. This reference manual contains helpful photographs, diagrams and step-by-step instructions, all tailored to the "simple, decent" Habitat house design. The book is available through Habitat's "Build Brand" store accessed via My.Habitat (select the green STORE tab):

http://my.habitat.org

"Building Better Homes" CD training program

In 2005, HFHI, in cooperation with building industry partners, produced an interactive CD training program with step-by-step instructions for each stage of the house construction process. Although not specifically tailored to Habitat houses, the

CD set is an excellent "self-paced" training resource for members of an affiliate's construction team, as well as other staff and committee members who want to gain a better understanding of building science basics.

The CD set is available through the Building Knowledge Web site: http://my.habitat.org/link/g2e86b

"With each nail hammered or block laid, we serve as Christ's hands and feet, helping build His Kingdom on earth, His habitat for humanity."

—Jonathan Reckford, CEO, Habitat for Humanity International

Hearts and heads for Habitat

By Jonathan Reckford, CEO, Habitat for Humanity International

Thanks to committed partners like you, Habitat for Humanity is changing millions of lives around the world. Your effort — and the contributions from many others like you — will help us reach exponentially more families going forward. With an abiding trust in God, we'll continue to work together with families toward their own decent, affordable housing solution. This affiliate operating manual is meant to help that process.

To build on our past success, we need to be both passionate and dispassionate in our approach to the mission we share in common. We need to use our hearts, and our heads.

I've never seen staffers, volunteers and partners embrace a mission with more passion than at Habitat. Working alongside families and seeing transformed lives sustains our passion and that's necessary to move our ministry forward.

But we also must be dispassionate as we work together. House construction needs planning and coordination. There are houses to design, building materials to purchase and get to the site on time, worker safety to ensure and all the other pieces that must come together to successfully build a Habitat for Humanity home.

These facets and others are covered in this volume, "Affiliate Operating Manual: Construction," which is an integral part of the affiliate operations manual series. We've drawn upon the expertise of many supporters, as well as the experience of thousands of wall-raisings and rehabilitations to compile this resource, which I hope you will consider a valuable tool in your efforts.

Thank you for your investment in this ministry. Thank you for using this resource. And thank you for being both passionate and dispassionate about the mission we're called to together — for giving your head, and your heart.

2. Construction safety

Habitat for Humanity International (HFHI) and its affiliates are committed to providing a safe and healthful construction site for volunteers and staff, as well as outside contractors. HFHI's safety goal for its affiliates is **zero accidents**. In order to achieve this goal, it is incumbent upon each affiliate to make safety a primary focus of its operations. The cornerstone of that effort should be the preparation and implementation of a comprehensive construction safety policy which has been specifically tailored to fit the affiliate's operations. The policy should not only describe recommended safety practices, but should also outline the manner in which staff and volunteers will be trained to follow these practices and how their performance will be monitored.

This chapter discusses the elements of a sound safety policy and also discusses the safety risks which are most frequently encountered by Habitat affiliates on construction sites.

The Affiliate Safety Policy:

HFHI's U.S. Affiliated Organization Policy Handbook (Policy 7) requires that each affiliate adopt and implement a written construction safety policy. The affiliate's safety policy should be a comprehensive program which incorporates the following general components:

1. Adoption of written safety practices, consistent with National Association of Home Builders (NAHB) recommended guidelines and Occupational Health and Safety Administration (OSHA) standards. Founded in 1942, NAHB is a federation of more than 800 state and local associations. A link to the NAHB publication which contains these recommended guidelines is provided below.
2. The provision of an appropriate amount of safety training to all staff and volunteers who will be involved in construction.
3. Creation of a worksite environment in which safety is viewed as paramount by all workers – employees, volunteers and third-party contractors.
4. Constant monitoring and evaluation of safety practices, including updating such practices as needed.

Top safety concerns

Based on affiliate surveys, HFHI has identified the most common safety concerns on Habitat construction sites. The affiliate should ensure that its safety training programs specifically address each of these risks, as well as any other specific risks that are frequently encountered by the affiliate in its construction operations. Note that many of the top safety concerns overlap with others. For example, roof safety includes not only fall prevention, but also measures to prevent the dropping of tools on workers below. The top safety concerns are:

1. Roof safety

Roof work can be particularly dangerous and requires the work crew to exercise extreme caution. Workers can slip, trip or fall for a variety of reasons, including improper footwear, windy or slippery conditions, improperly secured ladders, a cluttered work area, etc. For specific advice on how to work safely on a roof, refer to OSHA's Fall Protection eTool:

http://my.habitat.org/link/g2eaa6

2. Dropping of tools

Falling objects are a common cause of serious injury in the construction industry generally, as well as on Habitat sites. Hammers, saws, power drills and other commonly used tools can pose a serious risk once they leave a user's hands. For specific instructions on the safe handling of tools on the jobsite, refer to OSHA's Hand and Power Tool e-Tool:

http://my.habitat.org/link/g2eaca

And to OSHA's Personal Protective Equipment eTool for information on equipment such as hard hats:

http://my.habitat.org/link/g2eacd

3. Ladder safety

Ladder safety involves multiple components – the ladder must be the correct size for the job, in sound condition and properly set up to ensure stability. In addition, the worker using the ladder must observe a number of safe practices, including facing the ladder at all times, wearing proper footwear and never climbing above the third highest rung.

4. Housekeeping: Keeping a clean worksite

Keeping a clean and orderly worksite increases efficiency and enhances worker safety. Building materials and supplies should be carefully laid-out to create adequate aisles and walkways, which should remain clear at all times. Improperly stored or secured construction debris, tools and materials can create a tripping hazard. Loose nails in discarded scrap lumber are leading causes of puncture wounds. For construction site housekeeping tips, refer to the Housekeeping at the Construction Site document on My.Habitat:

http://my.habitat.org/link/g2eb37

5. Fall protection

Falls are the most common injury on Habitat jobsites. Falls can occur from roofs, ladders and scaffolds, and tripping injuries can occur at ground level due to construction debris, improperly stowed tools and materials and similar hazards. It is essential that edges and sides of elevated floors and floor openings be fully protected at the construction site. If such openings are not properly secured, injuries from falls or falling objects may result, ranging from sprains and concussions, to spinal injuries to death. For specific advice on avoiding falls refer to OSHA's sample fall protection plan:

http://my.habitat.org/link/g2eaa1

6. Scaffolds

Scaffolds are sometimes used on Habitat houses to allow workers to comfortably access their work. The use of scaffolding creates two major safety risks – (1) falls from the scaffolding and (2) collapse of the scaffolding. For recommendations on scaffold safety refer to OSHA's Guide to Scaffold use in Construction:

http://my.habitat.org/link/g2eaa0

And the OSHA Scaffolding Quick Reference Guide:

http://my.habitat.org/link/g2ea9f

7. Electrical protection

The use of electrical equipment and the presence of live electric wires on the construction site can pose a number of hazards. In general, OSHA requires [29 CFR 1926.416(a)(1)] that employees not work near any part of an electrical power circuit unless protected. See OSHA Electrical Safety Regulation 29 CFR 1926.416(a)(1):

http://my.habitat.org/link/g2eace

OSHA eTool program provides excellent information and resources on electrical hazards that are the most frequent cause of electrical injuries on construction sites:

- Contact with power lines: http://my.habitat.org/link/g2ead0
- Lack of ground-fault protection: http://my.habitat.org/link/g2ead1
- Path to ground missing or discontinuous: http://my.habitat.org/link/g2ead3
- Equipment not used in manner prescribed: http://my.habitat.org/link/g2ead4

- Improper use of extension and flexible cords: http://my.habitat.org/link/g2ead9

8. Guarding floor and wall openings

It is essential that the edges and sides of elevated floors and of all floor and wall openings be fully protected at the construction site. If such openings are not properly secured, injuries from falls or falling objects may result, ranging from sprains and concussions, to spinal injuries to death. For guidelines on how to properly secure a wall or floor opening, refer to OSHA's eTool:

http://my.habitat.org/link/g2eadd

OSHA's sample Fall Protection Plan:

http://my.habitat.org/link/g2eaa1

9. Fire protection

Many construction site activities have the potential to spark a fire. As a result, the affiliate's safety plan should include a fire safety component, including fire prevention and evacuation procedures. The OSHA Web site has regulations and resources for fire prevention, protection and safety:

- Fire Prevention Regulation: http://my.habitat.org/link/g2ea9e
- Fire Protection Regulation: http://my.habitat.org/link/g2ea9d
- Fire Safety: http://my.habitat.org/link/g2eada

Proper clothing for construction

Proper clothing is as essential as the proper selection and use of tools. The site supervisor and crew leaders should make certain that each worker is wearing clothes, gloves and footwear that are appropriate for the work and weather conditions. Loose clothing is especially dangerous around power tools.

Hard hats should always be worn during demolition work, or whenever overhead work of any type is underway or an overhead hazard is present – and any other time that the site supervisor or crew leader deems a hard hat to be necessary.

Protective glasses **must** be worn while operating a power tool – and any other time that the site supervisor or crew leader deems protective glasses necessary. Ear protection should be worn on site when using a power tool for a prolonged period of time – and any other time that the site supervisor or crew leader deems a hard hat necessary.

Each volunteer should wear a dust mask when installing insulation or when sanding – and any other time that the site supervisor or crew leader deems it necessary.

Specific safety responsibilities of the affiliate and construction crew

The affiliate's written safety policy should clearly articulate responsibilities of the affiliate, as well as members of the construction crew. Each member of the construction crew (including volunteers) should be advised of his or her responsibilities. A suggested division of minimum responsibilities is as follows, and the affiliate should feel free to incorporate additional responsibilities particular to its operations:

Affiliate responsibilities

Each affiliate should:

- Obtain a copy of the NAHB "Home Builders Safety Program" book, which can be purchased at: http://www.builderbooks.com
- Understand and comply with all relevant requirements of the Occupational Health and Safety Administration (OSHA), as may be required.

- Develop a comprehensive written safety policy; HFHI recommends adoption of a safety policy incorporating the applicable provisions of the NAHB Home Builder's Safety Program and which is otherwise consistent with OSHA standards.
- Publicize the Top Safety Concerns throughout the affiliate's staff and construction team and implement proactive methods to address these concerns.
- Appoint a safety committee or safety supervisor to oversee the affiliate's safety program.
- Communicate safety requirements to all site supervisors and crew leaders; ensure that all site supervisors and crew leaders receive adequate safety training.
- Provide safety training for all volunteers.
- Provide safety training for all employees who will be working at a construction site.
- Provide First Aid and CPR training for all site supervisors and crew leaders.
- Have a Trauma kit available at worksites.
- Hold site supervisors responsible for safety at their projects. For employees, make safety issues part of the employee's performance review.
- Have a written record retention policy that should include recordkeeping provisions for reporting and documenting accidents.
- Begin each workday with prayer.

Site Supervisor responsibilities

Each site supervisor should:

- Monitor the worksite's safety status by personally conducting daily safety inspections of the worksite and initiating needed corrective action.
- Conduct accident investigations, analyze the causes and formulate recommendations for corrective and preventative action.
- Maintain accurate records of all accidents.
- Conduct on-site safety training for all volunteers, with particular emphasis on the "Top Safety Risks" relevant to the day's work.
- Monitor the safety performance of all subcontractors to ensure compliance with the affiliate's safety standards.
- Post the emergency telephone number to call in case of fire or an accident (911 service is not available everywhere) and note during volunteer orientation.
- Post the worksite address in a conspicuous place and note during volunteer orientation.
- Receive CPR and First Aid training.
- Ensure than an adequately stocked First Aid kit is on site.
- Set a good example – comply with all safety rules and regulations.

Crew Leader responsibilities

Each crew leader should:

- Maintain a safe and secure work area.
- Conduct on-site safety training for volunteers in his or her crew, with particular emphasis on the "Top Safety Risks" relevant to the day's work.
- Know the emergency telephone number to call in case of fire or an accident (911 service is not available everywhere).
- Know the worksite address.

- Enforce safety rules and regulations among volunteers; constantly reinforce the importance of the safety rules and regulations.
- Receive CPR and First Aid training.
- Set a good example – comply with all safety rules and regulations.

Volunteer responsibilities

Each volunteer should:

- Review safety materials provided by the affiliate.
- Participate in all safety training offered by the affiliate, including any available online safety training modules.
- Comply with all safety rules and regulations.
- Report all accidents and injuries immediately to the supervisor in charge.
- Obtain the proper tools and personal protective equipment for the job at hand.
- Report all unsafe conditions to the supervisor in charge.
- Know what emergency telephone number to call in case of fire or an accident (911 service is not available everywhere).
- Provide current emergency contact information to the designated affiliate staff member at the beginning of the workday.
- Help maintain a safe and clean work area.

Risk management

Although careful adherence to a comprehensive safety policy should minimize an affiliate's number of construction site incidents, such incidents may still occur. In order to manage risks associated with construction site incidents, the affiliate should:

- Maintain adequate insurance, including General Liability, Builders Risk, Volunteer Medical and Disability and Director and Officer Liability
- Use only licensed subcontractors and enter into a written agreement that provides protection to the affiliate for the subcontractor's acts and omissions. Check references.
- Ensure that all subcontractors have adequate insurance, including General Liability and Workers Compensation. Require subcontractors to provide a certificate of insurance that names the affiliate as an additional insured.
- Require all volunteers to sign a Release and Waiver of Liability prior to working on a Habitat construction site. Frequent volunteers should be asked to sign a Release and Waiver of Liability at least annually.
- Require all subcontractors who are donating services to sign a Release and Waiver before working on a project.
- Restrict the involvement of children on the worksite consistent with HFHI policy and federal and state regulations.

NOTE: *All site supervisors and crew leaders should be trained in CPR and first aid and there should be an adequately stocked first aid kit on the construction site at all times. The site supervisor should have on hand at the build site emergency contact information for each worker.*

For additional risk management assistance relating to safety and other issues, contact HFHI's Risk Prevention and Response Unit, call the U.S. Support Center at 877-434-4435, or e-mail USSupportCenter@habitat.org.

HABITAT FOR HUMANITY AFFILIATE INSURANCE PROGRAM

Affiliate insurance program/Online safety training resources

HFHI has implemented an affiliate insurance program through Lockton Risk Services, Inc. (Lockton). Lockton has more than 20 years experience in program administration and an extensive background in the home-building industry. A separate Web site for the affiliate insurance program can be accessed at http://www.hfhaffiliateinsurance.com.

The Habitat affiliate insurance program Web site contains free resources on safety and loss control, including online safety training courses. The training materials can be accessed at http://www.hfhaffiliateinsurance.com

My.Habitat

To quickly find recommended resources and information on safety-related policies visit My.Habitat's Knowledge Center:

http://my.habitat.org/kc/tags/Construction/Construction-Safety

Additionally, the U.S. Construction site on My.Habitat is a must-have bookmark. Pay special attention to the Templates and Download collection of resources as they are constantly being updated:

http://my.habitat.org/BusinessOperations/USConstruction

Safety resources

National Association of Home Builders (NAHB)

As indicated above, HFHI recommends that affiliates incorporate NAHB's published safety guidelines into their safety policies. These guidelines can be found on the NAHB Web site as follow:

- National Association of Home Builders (NAHB) or http://www.nahb.org/
- In addition, dozens of safety topics are covered in the National Association of Homebuilders "Home Builders Safety Program" book, which can be purchased at www.builderbooks.com

Legal Requirements

In addition to meeting Habitat construction safety standards, the affiliate must observe all applicable federal, state and local safety laws and regulations. Information on certain federal requirements can be found at the following Web sites:

- Occupational Safety and Health Administration (OSHA) or www.osha.gov
- Child Labor Law requirements can be accessed from the Youth Rules Web site: Click Here for English or Here for Spanish
- Child labor laws vary state by state, Click here to locate your state's child labor restrictions

Additional OSHA links

OSHA Offices

Directory of States with Approved Occupational Safety and Health Plans

Alaska

Arizona

California

Connecticut

Hawaii

Indiana

Iowa

Kentucky

Maryland

Michigan

Minnesota

Nevada

New Jersey

New Mexico

New York

North Carolina

Oregon

Puerto Rico

South Carolina

Tennessee

Utah

Vermont

Virgin Islands

Virginia

Washington

Wyoming

Resources by alphabet

HFHI has compiled the following links for use by affiliates in developing and implementing their safety programs:

Accident Investigation Report Form – Sample Habitat for Humanity accident investigation form:

http://my.habitat.org/link/g2eb0e

Affiliate Management – Safety requires planning and organization and should not be assigned to the construction committee alone. Establishing well planned and thought out work rules for construction site safety and observing these rules will ensure safe practices at the worksite. This link provides a short summary of suggested safety management practices:

http://my.habitat.org/link/g2eb0f

Demolition – This link contains a short summary of OSHA standards on demolition, with additional links:

http://my.habitat.org/link/g2eb11

Drywall/Painting – This link contains a short summary of issues relating to drywall and painting work tasks:

http://my.habitat.org/link/g2eb12

Emergency Medical Information – This link contains a sample Habitat for Humanity contact and medical information sheet that affiliates are encouraged to use:

http://my.habitat.org/link/g2eb20

First Aid-Emergency Response – Even with an effective safety program, an affiliate may still experience construction site accidents. This link contains helpful information regarding effective accident response techniques:

http://my.habitat.org/link/g2eb14

Electrical – The links below outline the most common hazards associated with the use of electrical equipment (and the presence of live power lines) at the construction jobsite:

Contact with Power Lines: http://my.habitat.org/link/g2ead0

Lack of Ground-Fault Protection: http://my.habitat.org/link/g2ead1

Path to Ground Missing or Discontinuous: http://my.habitat.org/link/g2ead3

Equipment Not Used in Manner Prescribed: http://my.habitat.org/link/g2ead4

Improper Use of Extension and Flexible Cords: http://my.habitat.org/link/g2ead9

Fall Protection –This page highlights OSHA standards, Federal Register provisions (rules, proposed rules, and notices), the Regulatory Agenda (a list of actions being taken with regard to OSHA standards), preambles to final rules (background to final rules), directives (instructions for compliance officers), standard interpretations (official letters of interpretation of the standards), example cases, and national consensus standards related to fall protection:

http://my.habitat.org/link/g2eaa1

The following additional links provide information on particular fall risks:

Unprotected Sides, Wall Openings, and Floor Holes: http://my.habitat.org/link/g2eadd

Improper Scaffold Construction: http://my.habitat.org/link/g2eae0

Unguarded Protruding Steel Rebar: http://my.habitat.org/link/g2eae1

Misuse of Portable Ladders: http://my.habitat.org/link/g2eae2

Floor and Wall Openings – Wall and floor openings can pose a significant threat to safety, and steps should be taken to reduce the risk of a worker falling through an opening. This link summarizes basic precautions and affiliate should implement to safeguard floor and wall openings:

http://my.habitat.org/link/g2eadd

Framing – While there are no specific OSHA standards applicable to this particular task, the following topics (listed elsewhere in this section) are relevant: Stairways and Ladders, Scaffolding and Personal Protective Equipment:

http://my.habitat.org/link/g2eb16

Hand and Power Tools – This page highlights OSHA standards, directives (instructions for compliance officers), and standard interpretations (official letters of interpretation of the standards) related to the use of hand and power tools in the workplace:

http://my.habitat.org/link/g2eaca

Hazardous Materials –Refer to OSHA's Emergency Preparedness and Response Safety and Health Topics Page:

http://my.habitat.org/link/g2eb42

Landscaping – While there is no specific OSHA Standard relating to landscaping, the affiliate should be aware of the risk associated with the use of hazardous chemicals on the jobsite. The link provides a short summary of those risks:

http://my.habitat.org/link/g2eb23

Lead – Lead overexposure is one of the most common overexposures found in industry and is a leading cause of workplace illness. This link contains a number of OSHA links and references regarding lead:

http://my.habitat.org/link/g2eb22

This is a link to EPA online information on lead-base paint:

http://my.habitat.org/link/g2e83d

Nail Gun Safety – Nail guns pose a serious construction site risk. Although HFHI does not forbid the use of nail guns on the worksite, it does recommend against such use. For affiliates which nevertheless chose to use nail guns, the link contains guidelines on proper nail gun use:

http://my.habitat.org/link/g2eb24

OSHA Construction Industry Digest – OSHA requires employers to record information about every occupational **death**, every nonfatal occupational **illness**, and certain nonfatal occupational **injuries**. This link contains additional information on these record keeping requirements, along with a copy of the required form:

http://my.habitat.org/link/g2eb44

Parental Authorization (for treatment of a minor) – This link contains a sample form for Parental Authorization for emergency medical treatment provided to an injured minor:

http://my.habitat.org/link/g2eb26

Personal Protective Equipment – OSHA requires the use of personal protective equipment (PPE) to reduce employee exposure to hazards when engineering and administrative controls are not feasible or effective in reducing exposure to acceptable levels. This link contains additional OSHA resources and link regarding PPE's:

http://my.habitat.org/link/g2eb27

This is a link to OSHA's PPE guidance:

http://my.habitat.org/link/g2eacd

Plumbing and Electrical The OSHA standards applicable to electrical work are found in 29 CFR Part 1926.950-960 and 400-408. While there are no specific sections for plumbing, the standards mentioned under the following topics of this section are relevant: Floor and Wall Openings, Hand and Power tools, and Personal Protective Equipment:

http://my.habitat.org/link/g2eb28

Release and Waiver of Liability- This link contains a sample release and waiver of liability form. The purpose of this form is to release the affiliate from liability for personal injury, property damage and wrongful death. **Before using this release and waiver form, the affiliate should confirm with its local attorney that the form conforms to local law:**

http://my.habitat.org/link/g2eb2a

Release and Waiver of Liability for Minors - It is critical that affiliates obtain a release and waiver of liability before any minor volunteer is allowed to work on the worksite. This link contains a sample release and waiver of liability form to be used for minors on the jobsite. The purpose of this form is to release the affiliate from liability for personal injury,

property damage and wrongful death. **Before using this release and waiver form, the affiliate should confirm with its local attorney that the form conforms to local law.** Refer to Chapter 7 of this manual and Policy No. 21 of HFHI's U.S. Affiliated Organization Policy Handbook regarding restrictions on youth involvement on worksites.:

http://my.habitat.org/link/g2eb29

Roofing - The only OSHA standard which specifically refers to roofing is 29 CFR Part 1926.501 (8)(10) and (11). This applies only to the guarding of build-up roofing work. In addition, the standards mentioned under the following topics in this section are relevant: Floor and Wall Openings, Hand and Power Tools, Stairways and Ladders, Scaffolding, Floor and Wall Openings, and Personal Protective Equipment:

http://my.habitat.org/link/g2eb2b

Scaffolding - Stability is a primary safety concern. The OSHA rules contain specific requirements for certain types of scaffolding. This link contains a number of OSHA links and references regarding scaffolding:

http://my.habitat.org/link/g2eb2e

Stairways and Ladders - Ladders expose workers to a variety of safety risks. This link contains a number of OSHA links and references regarding stairways and ladders:

http://my.habitat.org/link/g2eb2f

Struck By - This link contains an OSHA discussion of the risks of being "struck by" various objects, including vehicles and walls, on a construction site, along with additional links:

http://my.habitat.org/link/g2eb45

Trenching - This link contains an OSHA discussion of the risks of digging trenches on a jobsite, along with additional links:

http://my.habitat.org/link/g2eaa7

Vehicle Safety - Any accident involving a vehicle being used for Habitat for Humanity purposes exposes the affiliate to a potential lawsuit. This link contains a short summary of risks associates with vehicle safety, along with additional links:

http://my.habitat.org/link/g2eb30

Work Crew Safety Manual - This link contains sample safety instructions for the volunteer work crew:

http://my.habitat.org/link/g2eb31

Safety checklists/forms/samples

Code of Safe Practices – Refer to this link for a sample code of safety practices. The code is general in nature and includes many types of construction activities. It is intended only as a SAMPLE that an affiliate can customize to describe its work environment:

http://my.habitat.org/link/g2eb1f

New Hire Safety Training Checklist – This checklist helps new hire/volunteer training and can be kept for affiliate records:

http://my.habitat.org/link/g2eb25

Online Safety Training Web site – Many hours of work have gone into the development of the attached online training programs. Each training subject is user friendly, informative and to the point. The training courses can be completed at the user's convenience (Internet access is required). It is recommended that each member of the affiliate's construction staff complete the applicable training programs:

http://my.habitat.org/link/g2eadb

Safety Checklist – A good checklist permits the Site Supervisor to quickly check and monitor the safety status of the worksite. The construction checklist can and should change to reflect the conditions on the worksite:

http://my.habitat.org/link/g2eb2c

3. Sustainable building... Habitat style

Although the terms “sustainable” and “green” building have become universally recognized, they often mean different things to different people and organizations. The purpose of this chapter is to establish common meanings for these terms within Habitat, and also to provide a general overview on how to incorporate sustainable building materials and practices into the construction of every Habitat home.

As discussed in this chapter, there is not a “one size fits all” approach to sustainable building. Goals can be met and achieved by Habitat affiliates at various levels – from Energy Star® Plus to LEED Platinum. In addition, building practices, materials and outside resources vary dramatically by climate region. As a result, although this chapter will identify various building practices, energy rating programs and multiple outside resources, it does not attempt to suggest a standardized approach to sustainable building.

Green building programs, techniques and resources change on a daily basis. Please use this chapter as a basic introduction and overview only, and rely on external resources referenced in this chapter and on My.Habitat for details and the most currently available information.

Financial sustainability

As a final introduction to the more technical aspects of this chapter, it is important to note that, although there continue to be significant technological advances in the realm of sustainable building, Habitat for Humanity is a provider of **affordable** housing. As a result, any sustainable or green building technique which is used on a Habitat house must also be financially sustainable for the family, both in terms of its initial cost and life cycle cost. Although many options may exist for particular issues, our first design criterion is the incorporation of affordable solutions for families who can least afford the cost of sophisticated technology, escalating energy costs and environmental conditions that compromise the health of their children.

Why sustainable building?

The terms sustainable building and green building are used somewhat interchangeably within the building industry and describe a type of construction which focuses on the following three interrelated goals: maximizing energy efficiency, maximizing indoor air quality and conserving natural resources. In the Habitat for Humanity context, the following three statements form the cornerstone of an organizational focus on sustainable building practices:

- Habitat houses should be energy-efficient;
- Habitat houses should be healthy places for our partner families to live;
- Habitat should incorporate building practices and materials that have a positive impact on our natural resources and the environment.

Energy efficiency: Habitat for Humanity’s mandate is to build simple, decent and affordable houses for our partner families. Traditionally, the word affordable has been principally associated with the cost to construct and maintain a home, rather than the ongoing cost to live in and operate a home. As energy costs continue to rise, however, it has become apparent that the concept of affordability must include all costs associated with homeownership – including energy costs. By expanding our focus from only initial affordability to long-term, all-inclusive house affordability, building a sustainable house can also result in the creation of sustainability for a family.

Healthy air quality: Poor building practices and inferior house systems can result in a number of air quality issues, the most common of which are mold and allergens. In addition, off gassing of chemicals (the releasing of vapors) found in certain building materials can contribute to indoor air quality issues. Although these types of invisible issues are certainly not unique to Habitat houses, our partner families deserve the benefit of building practices and materials which will maximize the air quality within their homes.

Protection of the environment: The residential building industry has a tremendous impact on energy usage in the United States. According to the Department of Energy, in 2005, the construction and operation of residential properties accounted for 21 percent of our nation's energy consumption, just behind transportation, at 27 percent. In addition, the construction and maintenance of commercial and residential buildings account for 30 percent of wood and raw materials used in the United States. The effects of residential construction on our environmental go far beyond excessive consumption of energy and materials. As one of many examples, sediments from unchecked construction site run-off can result in severe damage to fish and wildlife habitat in streams and lakes. The incorporation of simple practices designed to enhance energy efficiency, limit building material waste and eliminate environmental contamination can fundamentally change the negative effects that residential construction can have on the environment. Habitat for Humanity should be a leader – both nationally and locally – in these efforts.

The core elements of sustainable building

Sustainable building requires the general contractor to address certain core elements through the construction process, beginning with the preliminary stages of planning and design, and continuing through site development and house construction. The sustainability "rating" achieved by a house is dependent upon how many of these elements are incorporated into a house, and the extent of the incorporation. Another key feature of sustainable building is the treatment of the whole house as an integrated system, rather than a collection of unrelated parts.

A brief summary of the core elements of sustainable building, along with a few practical examples, is set forth below. As indicated from this list, many of the core elements of sustainable building are more closely related to sound construction practices and common sense than to technologically advanced systems and building materials. For a more detailed explanation and additional examples, please refer to our suggested outside references. The core elements of sustainable building are:

Energy efficiency: The house should be constructed to integrate various building components into a comprehensive system to conserve energy. Construction should generally include use of Energy Star® or higher rated systems, windows, lighting fixtures and appliances and building an energy-efficient house envelope. The HVAC system should be high efficiency and sized to meet the appropriate "Manual J and D" duct system calculations. Certified technicians should test the HVAC system for air infiltration, duct tightness and system air flow. Beyond mere energy efficiency, this is also a cost effective strategy for generally building a better and more durable home. In addition, simple volunteer friendly tasks such as caulking joints can result in significant utility cost savings.

The Web site www.toolbase.org is an excellent resource for energy-efficient systems and products. Affiliates can also navigate the path toward building energy-efficient homes by reading the "Affiliate Steps to Energy Star" document located on the U.S. Construction site's "Templates and Downloads" "Green Building Information" page on My.Habitat:

http://my.habitat.org/link/g2ea3a

Passive solar design elements benefit housing in all climate zones. Whenever possible, the long side of the house should face south, with the shorter ends facing east and west. The size, performance, location, and shading of windows should be taken into account when designing a passive solar home. Trees can also be strategically located (or retained) to provide cooling in the hot months and a wind break and warmer insulating air in winter. Passive solar design elements can be one of the least expensive ways to reduce future energy demands and bills.

Healthy indoor air quality: The elimination of indoor air contaminants where possible is an important component of green building. Filtering the air should be the last line of defense for controlling pollutants in the home – whenever possible, the

affiliate should incorporate measures that will prevent contaminants from entering the home in the first place. In order to control mold and moisture, proper building techniques and ventilation should be a key focus of house design and construction. In addition, products that contain low or no VOCs (volatile organic compound) should be used whenever possible. Many building products, such as urea formaldehyde (found in adhesives) and vinyl chloride (found in carpets and other building products) emit gasses and can be harmful.

The U.S. Construction Standards published by Habitat for Humanity International include the new Healthy Indoor Air Quality Standard. Following this new recommended standard helps to ensure homeowner health and the durability of the housing structure over time. The issues of ventilation, mold and moisture, combustion safety, radon risk reduction and healthier interior products that reduce asthmatic conditions are all addressed in this document:

http://my.habitat.org/link/1753

Materials and resources: The house should be designed to include systems and products that are more efficient, durable and environmentally friendly. Products which have recycled or reclaimed content should be used when practical. Plumbing systems can be designed to use shorter runs of piping. Finally, in order to limit the amount of resources used on a house, as well as landfill waste, construction should be planned in such a way that will limit waste of building materials.

Examples of environmentally friendly, durable products and systems include engineered framing systems, sustainably harvested lumber, long-lasting interior flooring, formaldehyde and fiberglass-free insulation, recycled content, and "pin" foundations (which eliminate the need for excavation) among others. These products reduce demand on resources while both improving building performance and providing a healthier home.

Water conservation: The scarcity of potable water is the second greatest environmental issue globally, second only to greenhouse gas emissions. Installation of dual-flush or low-flow flapperless toilets and low-flow faucet heads are excellent ways to reduce home water consumption. Rainwater collection systems can also be incorporated for landscape maintenance.

Landscaping: Landscaping can be designed in such a way that will conserve both energy and water consumption. Trees form an integral part of a "passive solar" design. Existing trees should be saved whenever possible. Downsizing or eliminating turf lawns greatly reduces water consumption. For further water conservation, native and drought-tolerant shrubs and trees should be installed in lieu of ornamentals and invasives (not native to local area).

Location: Affiliates focus on a variety of factors relating to house location – primarily, safety and close proximity to schools, public transportation and public services. Sustainable building focuses on many of the same issues, although the primary concern is the reduction of vehicle emissions. From a sustainability standpoint, the optimal house location will be close to schools, stores, jobs and public transportation.

Lifecycle costs: The home should be durable enough to last well beyond the term of the mortgage. In addition, to enhance durability of the home and its systems, the homeowner should understand the best way to maintain the home and all of its components.

Green rating programs

Green building rating programs provide guidelines for building in a more sustainable manner and establish a rating system for the completed building. The rating system creates a benchmark to measure a completed home to other homes. Energy Star and LEED (Leadership in Energy and Efficiency Design) are probably the two most widely recognized rating programs in the United States, but are only two of many such programs.

As discussed below under the topic "A Continuum of Sustainable Building Goals," the affiliate's first goal should be to achieve the Energy Star Plus standard (generally, a 15 percent whole house energy savings, plus healthy indoor air quality). When selecting any program other than Energy Star, the affiliate should confirm that certification under the program will, at a minimum, achieve Energy Star Plus standards.

Before selecting a rating program, the affiliate should carefully review the various rating programs which are available in its area and select a program which meets its short and long term goals for sustainable building. Factors to consider include:

- The level of energy savings that will be achieved under the program;
- The level of community and donor recognition of the program;
- Whether any grants or incentives will be available through the program;
- Whether any local utility company rebates will be available through the program;
- How much on-site technical assistance will the affiliate require, and what will the rating program charge to provide this support;
- When inspecting the house, whether the program uses a simple "visual" inspection (i.e., making sure that a component is installed) or a "performance based" inspection (i.e., making sure that the component is not only installed, but is also working properly). Performance based inspections will provide much more effective feedback for the affiliate.

In general, all of the programs have basic requirements in various categories, and also assign points for other measures that combine to a score for the overall rating of the house. Most programs are founded on the core elements of energy efficiency and basic building science, but then expand to some of the more advanced core elements (e.g., indoor air quality, water efficiency, etc.). In general, the programs comprise a collection of best practices for building systems, strategies and techniques.

Obtaining a certified program rating typically involves consulting with a program verifier early in the design process to review design plans and specifications, then continuing with onsite inspections during the construction process to test the building shell and ductwork for leakage and to document the building components.

The following terms, programs and companies are widely recognized in the home energy rating industry:

Austin Energy Green Building is one of the first green building programs in the country: http://my.habitat.org/link/g2eb46

Building America forms research partnerships with all facets of the residential building industry to improve the quality and energy efficiency of homes: http://my.habitat.org/link/g2eb47

Earth Advantage is a nonprofit sustainable building program in the Northwest. It works with builders and developers to bring the most energy-efficient, sustainable and healthy homes to the market: http://my.habitat.org/link/g2eb48

EarthCraft is a residential green building program administered in partnership with Southface Energy Institute. This program serves as a blueprint for energy and resource efficient homes. http://www.earthcrafthouse.com/

Energy Star® is an energy efficiency rating set by the U.S. Environmental Protection Agency. These homes are at least 15 percent more energy-efficient than homes built to the 2004 International Residential Code (IRC), and include additional energy-saving features that typically make them 20 to 30 percent more efficient than standard homes. http://my.habitat.org/link/g2eae8

Energy Star® Plus is the basic Energy Star rating, with the addition of healthy indoor air quality measures recommended by HFHI.

Green Seal is an independent nonprofit organization dedicated to safeguarding the environment and transforming the marketplace by promoting the manufacture, purchase, and use of environmentally responsible products and services. Green Seal certifies products that meet rigorous, science-based environmental leadership standards and recommends products that appear to meet the prerequisites for being environmentally responsible. http://www.greenseal.org

Enterprise Green Communities™ is the first rating program to focus entirely on affordable housing, and is based on the LEED program. http://www.greencommunitiesonline.org/

HERS Rating –Home Energy Rating System is the system of RESNET Ratings that provides a relative energy use index called the HERS® Index – a HERS Index of 100 represents the energy use of the "American Standard Building" and an Index of 0 (zero) indicates that the Proposed Building uses no net purchased energy (a Zero Energy Building). The raters that perform theses diagnostic tests (blower door and duct blaster) of homes qualify for Energy Star and other Green Building Programs. http://hersindex.net/

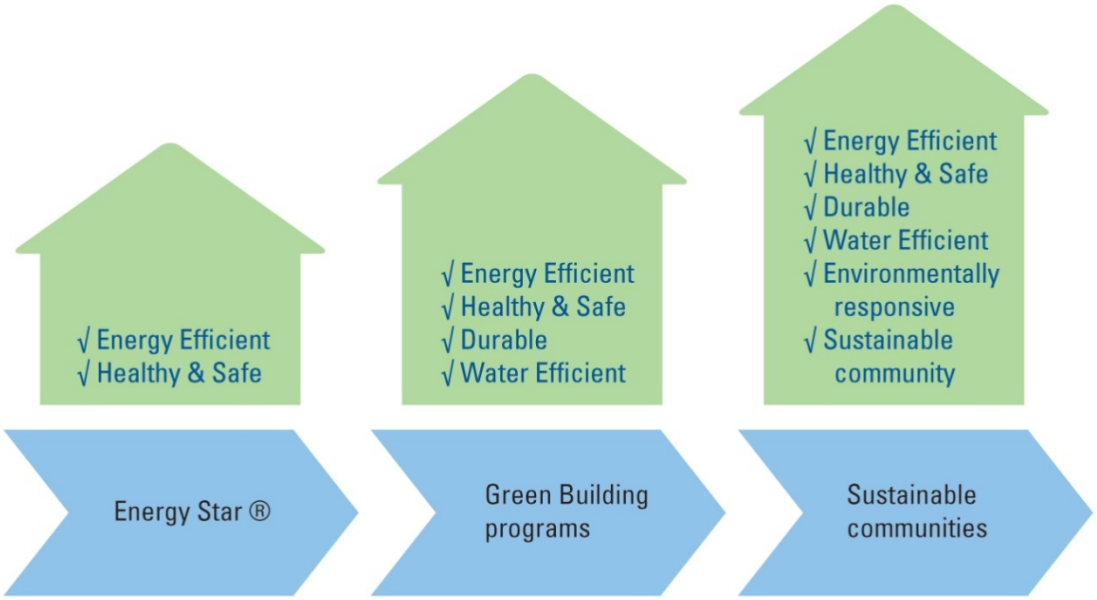
LEED for Homes is the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™, administered by the U.S. Green Building Council and a network of LEED providers, LEED for Homes is a voluntary

rating system that promotes the design and construction of high performance green homes. LEED for Homes has four levels of certification: LEED Certified, LEED Silver, LEED Gold and LEED Platinum (the highest level).

NAHB Green Building Standard (NAHB Green) is a program administered by the National Association of Home Builders for home builders and remodelers. http://www.nahbgreen.org/index.aspx

WaterSense is a voluntary partnership program sponsored by the U.S. Environmental Protection Agency. Its mission is to protect the future of our nation's water supply by promoting and enhancing the market for water-efficient products and services. http://www.epa.gov/watersense/

Sustainable building goals

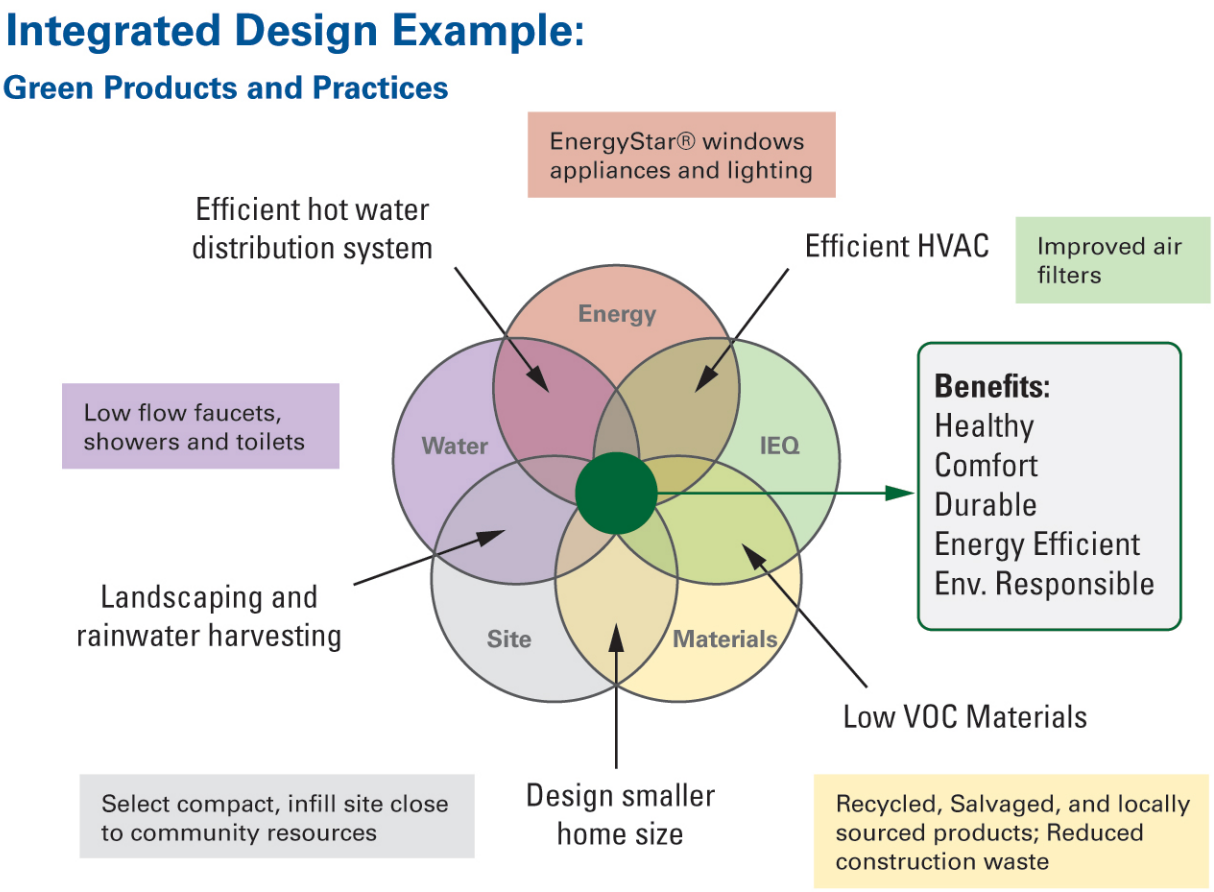


Creating a sustainability program at an affiliate is a process. The affiliate's first goal should be to achieve the Energy Star Plus standard, which generally results in a 15 percent whole house energy savings, plus healthy indoor air quality. This standard is, in fact, the minimum standard recommended by HFHI's U.S. Construction Standards and HFHI's U.S. Affiliated Organization Policy Handbook. Generally, achieving the Energy Star Plus goal will require the affiliate to improve the home's shell with double pane windows, air seal the building and ductwork, install energy-efficient appliances, provide a properly sized HVAC system and install insulation and components correctly:

http://my.habitat.org/link/g2ea3a

After mastering the Energy Star Plus standard, the affiliate may next choose to set a goal of building to a more comprehensive green building program standard. These types of programs generally result in a 30 percent whole house energy savings, and begin to focus on additional core elements of sustainable building. The program selected might be a national program such as LEED, or a regional program such as Earthcraft (in southeastern states) or Earth Advantage (n the Northwest). Generally, moving to this next level will require the affiliate to move beyond basic energy efficiency and air quality features relating to the building site, building materials and water conservation.

Finally, the affiliate may choose to move to an elite level of green building by pursuing an advanced certification such as LEED Platinum. Generally, this elite level requires an affiliate to broaden its focus to a higher level of sustainability, efficiency and durability, incorporating components which will have a positive impact on the surrounding area and the environment.



Plan ahead

The construction of a green house starts during design. It is inefficient, and in many cases impossible, to incorporate sustainable features once construction is underway. For each house, the affiliate should identify the rating that it wants to achieve – i.e., Earthcraft, Earth Advantage, LEED Certified, LEED Silver, etc. – then design and build the house to meet all necessary standards. The affiliate should also consult in advance with a verifier for the rating agency to determine when interim inspections must be performed and when to schedule them as well as help guide them throughout the process.

Web resources

Habitat for Humanity International:

HFHI public Web site

http://www.habitat.org

Documents on the My.Habitat U.S. Construction Standards Guidance:

http://my.habitat.org/link/6302

The Resource Development department handles "Gifts-In-Kind" product partnerships and discounts:

http://my.habitat.org/link/g2eb4a

Public link to U.S. Construction Web site:

http://www.habitat.org/env/

General Public—Agencies & Programs

http://www.energystar.gov/ Energy Star® and the new Indoor Air Package by EPA

http://www.epa.gov/iaq/homes/ U.S. Environmental Protection Agency's (EPA) Indoor Air Quality site

http://www.eere.energy.gov/buildings/building_america/ Building America (energy-efficient, durable & healthy housing, including technical advice for affordable housing)

http://architecture2030.com/home.html The 2030 Challenge on global warming

http://www.usgbc.org/ U.S. Green Building Council, LEED Program

http://www.greencommunitiesonline.org/ Green Communities (affordable housing)

http://www.ciwmb.ca.gov/GreenBuilding/Design/ State of California Green Building Resources

http://www.globalgreen.org/greenbuilding/ Global Green USA

General Public—Technical Assistance

http://www.greenhomeguide.org/ General green building resource guides and links

http://www.toolbase.org/ Technical information on building systems and products

http://oikos.com/ Building news, products and resources

http://www.greenbuildingblocks.com/ Resource on green building

http://www.greenbuilder.com/ General green building source book and links to programs

http://www.greenhomebuilding.com/ Alternative architecture, systems and products

http://www.designadviser.org/ Affordable green rehabbing

http://www.buildingscience.com/doctypes/primer/ Building Science Corporation's design ideas

http://www.cmhc.ca/en/ Canada's one-stop resource on housing, applicable to U.S.

http://www.solarenergy.org/ Workshops on building own solar systems & other methods

http://www.healthhouse.org/ Avoid toxic materials, particularly for indoors.

http://www.resnet.us/rater/partnership/default.htm RESNET Residential Energy Services Network

http://www.wbdg.org/ Whole Building Design Guide techniques and technologies

http://www.southface.org/web/resources&services/publications/factsheets/sf_factsheet-menu.htm Fact Sheets

Green Building/Building Science Conferences & Training Events

http://www.westcoastgreen.com/ West Coast Green, every September. Habitat-friendly. Discounts

http://www.greenbuildexpo.org/ Green Build Expo, every November

http://www.nahb.org/greenbuildingconference/ NAHB Green Builder's Show, every spring

http://www.southface.org/web/greenprints_conference/index.htm Green Prints every spring

http://www.buildingenergy.nesea.org/ (NESEA) Northeast Sustainable Energy Association

http://cnu.org/cnuxv/ Congress for the New Urbanism (CNU) Workshops, networking and policy discussions. Urban sustainable development practices

http://www.newurbanism.org/eventsplaces.html New Urbanism events around the U.S. on design/architecture, to planning and development

http://www.solarenergy.org/ Solar Energy International Hands-on training workshops on solar systems to wind power

http://www.affordablecomfort.org/ Affordable Comfort, every April. Building science. Habitat-friendly. May provide discounts. Plus regional training series

http://www.eeba.org/ (EEBA) Energy and Environmental Building Association, every October. Building science. Habitat-friendly. Provides discounts and limited free admission to local events. See My.Habitat for seasonal, regional workshops around the U.S.

http://www.nw.org/network/training/programs/cpm.asp NeighborWorks America Provides resources and training around the U.S. on quality affordable housing

4. Designing simple, decent, affordable homes

Basic guidelines for new construction

Habitat's mission is to build simple, decent, affordable houses for its partner families. Due to the diverse requirements and needs of individual projects, affiliates and partner families, no single design will work for all Habitat houses. As a result, Habitat for Humanity International (HFHI) has developed house design criteria and guidelines that give affiliates the flexibility to design a house suitable for particular circumstances while remaining true to the overall mandate of "simple, decent and affordable."

House design criteria: Meeting eight basic standards

Affiliates should develop a few standard house designs which meet or exceed local building requirements and can be used repeatedly with minor adaptations to meet any partner family's specific needs. These designs should work on any building site, with consideration given to the best possible orientation for passive solar design. For a discussion of passive solar design, refer to Chapter 3 of this manual.

Each affiliate must have a detailed description of what is, and is not, included in its basic house. Applicant families, new board members, architects, construction coordinators, public speakers and the press all benefit from a clear understanding of what Habitat means by "a simple, decent house" that is affordable to live in.

Selecting or developing an appropriate house design is a challenging, but rewarding, process. As discussed in more detail below, whenever possible, the affiliate should involve the partner family in the basic house design process so that the particular needs of the partner family can be incorporated into the house design. This type of collaboration helps to create a partnership between the affiliate and the applicant family.

The affiliate should strive to build a house that is safe, healthy, durable and energy-efficient, and that will not burden the homeowner with excessive repair and maintenance obligations. For new houses, the HFHI board of directors has adopted written "House Design Criteria," the principal portions of which are as follows:

- The living space provided—excluding stairwells (except to a basement) and exterior storage—should not exceed:
    - 900 square feet for a two-bedroom house
    - 1,070 square feet for a three-bedroom house
    - 1,230 square feet for a four-bedroom house
- The basic house should have only one bathroom and should be accessible to persons with disabilities. The bathroom may be compartmentalized for increased usefulness. Three-bedroom houses may have an additional half bath. Houses with four bedrooms or which are being constructed for a partner family having five or more members may have an additional full bathroom.
- Families should have an opportunity to choose decorative finishes for their house whenever possible.
- A budget may be established with a predetermined limit (e.g., $1,000) to allow the family to personalize its home with features such as appliances, fencing, a yard shed, etc.
- Each house should have a covered, primary entrance.
- When feasible, at least one entrance to the house should be accessible to persons who have difficulty with mobility.
- All passage doors, including the bathroom door, should be three feet (3') wide. Halls should be three feet - five inches (3' 5") wide from rough frame to rough frame. [Note: if there is a door in the hallway, the minimum width

increases to three feet, seven inches (3' 7") from rough frame to rough frame.] These standards allow easy access for persons with disabilities. Further adaptations may be needed if a family member is disabled.

- Homes should not have garages, basements or carports.

Deviations from the House Design Criteria

The House Design Criteria serve as the guidelines for the basic house. Substantial deviations from these guidelines can sometimes become necessary as a result of zoning regulations or subdivision covenants. Substantial deviations should be incorporated only after discussion by the affiliate's board of directors, in consultation with HFHI's Construction Technologies department. Affiliates must maintain the intent and spirit of the guidelines when incorporating any such necessary changes.

The House Design Criteria fact sheet can be downloaded from:

http://my.habitat.org/link/1031

Incorporating Green Building concepts into the house design

HFHI's U.S. Construction Standards and the U.S. Affiliated Organization Policy Handbook's Policy No. 7 recommend that the house should be built to a minimum of Energy Star® plus healthy air quality standards. Consideration of energy-efficient options should begin during the initial planning stages for the house.

From a pure design standpoint, there are a number of simple "passive solar" design and house orientation features that can enhance the energy efficiency of the house by as much as 25 percent. For example, if feasible, the house should be oriented in such a way (generally, facing a few degrees toward true south) that takes maximum advantage of natural lighting. Even if this is not feasible due to building lot constraints, features such as overhangs, shade landscaping and window location and sizing location can have a significant impact on the home's overall performance.

Energy efficiency should also be factored into the selection of house systems (e.g., heating, ventilation and air conditioning systems) and materials, including insulation, light fixtures, plumbing fixtures, windows, doors, etc.

For more information about how house design, systems and materials can enhance energy efficiency, refer to Chapter 3 of this manual.

Visitable, universal design, accessible housing

HFHI strongly encourages affiliates to incorporate design features which make houses minimally adaptable to persons with physical disabilities. Universal Design features typically add very little to the cost of a house; the expense associated with making a house accessible is also negligible.

Remember, too, that multifamily units must adhere to the Fair Housing Amendments Act of 1988, which includes, without limitation, requirements relating to "visitability." The Fair Housing Act Design Manual can be downloaded from:

http://my.habitat.org/link/g2eaec

As modified for Habitat houses, these visitability requirements are as follows:

A **visitable** home is one that includes design features that make it possible for persons with mobility limitations to at least enter (visit) the home and use the bathroom. A visitable house will include:

- A barrier-free visitable route
- At least one zero-step entrance
- Doors that should be 3'-0" wide
- Hallways that should be 3'5" wide (from frame to frame)

A **Universal Design** building is designed and built to provide a certain minimum level of accessibility to a person with a physical disability. Features that provide complete accessibility can be added or altered later, although including them from the outset will reduce future costs and inconvenience. Features typical of a Universal Design residence are:

- Unobstructed hallways
- Light switches and other controls located within reach from a wheelchair
- Reinforcements within walls that may need future grab bars, especially in the bathroom
- Kitchens and bathrooms that permit wheelchair maneuverability
- Main electrical panel on ground floor

HFHI's minimum requirements for Universal Design (House Design Criteria 2, 5, 6 and 7 above) provide evidence of compliance with Fair Housing guidelines.

A **Visitability and Universal Design Standard fact sheet** can be downloaded from:

http://my.habitat.org/link/1502

An **accessible** building can be approached, entered and used by individuals with physical disabilities. This means that routes are unobstructed, thresholds can be crossed with wheelchairs or other mobility aids, and interior spaces can be entered and maneuvered in a wheelchair. These conditions require special care in the design of entrances, halls, kitchens and bathrooms.

Features typical of an **accessible** dwelling include grab bars for support in the bathrooms; tub seats or accessible showers; roll-in sinks and counter areas; and ramps to entrances. If a member of the partner family has physical disabilities, these features would be installed at the time of initial construction. If no such disabilities exist, the house should nevertheless be constructed with blocking for grab bars in the event that it becomes necessary to install them later. Any other accessibility features would be installed if and when necessary.

Habitat's Accessible Housing Manual can be downloaded from:

http://my.habitat.org/link/1035

HFHI, while recognizing the issue of cost for some of these features, strongly encourages affiliates to use them where feasible and to go beyond the elements needed for houses to be minimally adaptable.

Refining drawings for a Habitat house

Once a house design is selected, refinements may be necessary. Before beginning the lengthy process of securing a building permit, the architect or another individual appointed by the construction committee must check the design against local building codes and ordinances, and also confirm that the actual building site will accommodate the design.

As provided in HFHI's U.S. Construction Standards and U.S. Affiliated Organization Policy Handbook (Policy No. 7) it is recommended that the house be built to a minimum of Energy Star® plus healthy air quality standards:

http://my.habitat.org/link/3200

The best time to incorporate changes to the building process is at the beginning before plans are sent for permitting and specifications are sent to trade contractors. By looking at simple choices throughout the building process, the affiliate can ensure that homes are more affordable to live in and maintain.

The permitting process will proceed more quickly if the construction committee and the designers involved are familiar with local requirements. Affiliates should obtain a copy of the local building code, often based on a model code with certain additions, and any local ordinances that affect design. These materials should contain information such as whether an architect's stamp is required for the drawings, whether special design considerations must be made (for example, flood plain construction requirements, historic district design criteria, etc.), and what specifications and standards of construction must be satisfied.

The number, type and extent of drawings required for a project are typically dictated by building department requirements. Prior to filing an application for a building permit, the affiliate should check with the building department to ensure that it prepares and submits drawings in the proper format and of sufficient quantity.

While drawings are being completed and conformed to the requirements of codes and ordinances, any changes to the plans must be evaluated to determine their effect, if any, on the building's specifications. **If either the quality or quantity of**

materials should change, the materials coordinator, who may already be acquiring the project materials, must be told immediately. If the changes are extreme, cost may be affected and a re-evaluation of the design may be necessary. For a detailed discussion of building specifications, refer to Chapter 8 of this manual.

Diagrams or drawings that assist in this process are readily available from material manufacturers, such as vinyl-siding companies and window manufacturers. Different manufacturers indicate how to cut materials such as sheathing and trim to prevent unnecessary waste and frustration.

In most jurisdictions, a set of drawings that has been stamped "Working Drawing for Construction" is required in order for the affiliate to obtain a building permit. The affiliate should use these drawing to prepare the "take-off" list (a materials list) and to price any subcontracted work. For a detailed discussion of "take-off" list preparation, refer to Chapter 8 of this manual.

In no event should preliminary drawings be used to prepare the take-off list or to finalize a contract with a subcontractor. Reliance on preliminary drawings increases the risk of ordering the wrong amount or type of materials and opens the door for subcontractors to request costly change orders. Do not start construction without a complete and final set of working drawings, as approved by the local permitting agency.

Working with the partner family

An affiliate's work with Habitat partner families does not end when construction is completed. For more information on issues concerning Habitat's relationship with partner families, please see the Family Selection and Family Support affiliate operating manuals. The family's involvement in the construction process can be summarized as follows:

Selecting a house design

Whenever possible, members of the Habitat partner family should be allowed to participate in selecting their house design. Remember, the affiliate is building the house with the family, not for the family. The Construction committee should present the partner family with several options that meet Habitat's design criteria and that also address relevant factors such as neighborhood characteristics, the building site, family size and any special family needs.

HFHI, in partnership with the Institute of Classical Architecture and Classical America, has produced a book entitled "A Pattern Book for Neighborly Houses," which offers general direction for architectural details, materials, shapes, site plans and landscape elements for Habitat houses. The book may be accessed through the U.S. Construction site on My.Habitat:

http://my.habitat.org/link/6345

In addition, HFHI maintains a set of Habitat typical house plans in the HFH Planbook:

http://my.habitat.org/link/5977

The resource includes various formats – including plans for urban appropriate home construction. Contact the Construction Technologies department for more information.

Establishing an options list

The options list allows families to personalize their homes. A discretionary sum of money should be established; the amount should remain consistent for every family. Some affiliates designate $300 to $1,000 to allow the family to add another bathroom; install ceiling fans, storm doors and shutters, etc. The allowance amount varies among affiliates.

Sweat equity and house construction

NOTE: This section focuses on the role of sweat equity in the construction process only. For more information on sweat equity requirements generally, refer to the "Affiliate Operating Manual: Family Support."

Sweat equity is the actual hands-on work that partner family members perform in the construction of their own home, as well as participation in other Habitat and community activities. Sweat equity is designed to meet three important goals:

- Partnership – Sweat equity provides meaningful interaction between partner families, affiliate representatives and Habitat volunteers.
- Pride in homeownership – Hours worked on their home during the construction process helps family members begin the transition to homeownership.
- Development of skills and knowledge – On the building site, partner family members should gain a genuine understanding of the construction of their home and maintenance issues they will face after occupancy.

The affiliate's sweat-equity policy should clearly state:

- The number of required hours;
- Who is eligible to work the hours;
- The type of tasks that qualify as sweat equity.

These requirements should be detailed in the partner family's letter of acceptance. The sweat-equity timeline, which must be individually tailored for each partner family, also should be negotiated and agreed to before the letter of acceptance is signed.

Affiliates should not place a dollar value on sweat equity; and sweat equity should never be interpreted as part of, or in lieu of, a down payment on the home.

NOTE: Placing a dollar value on sweat equity could result in a legal order to pay wages or provide fiscal reimbursement if a partnership with a family terminates before closing.

To ensure that all families invest their share of sweat equity, affiliates must require a minimum number of volunteer work hours per family. So that partner families do not become overburdened and overwhelmed, the hour requirement should be realistic and compatible with the house building schedule. HFHI policy requires not less than 200 hours of sweat equity per household, including 100 hours in construction, with appropriate accommodations made for family members with physical limitations. Most affiliates require between 300 to 500 hours of sweat equity. See U.S. Affiliated Organization Policy Handbook, Policy No. 11:

http://my.habitat.org/link/3200

Although sweat equity hours may be performed on houses other than the partner family home, in order to promote pride in homeownership, sweat equity worked on construction of the partner family's own home should always be the priority. The sweat equity policy also can assign a pre-determined number of hours to specific tasks. These tasks should be jobs that any family can accomplish (for example, installing the insulation, maintaining the site, landscaping the lawn, etc.). Affiliates should schedule construction so that families have ample time to complete the required hours.

As indicated above, one of the three purposes of sweat equity is the development by partner family members of skills and knowledge relating to home construction and maintenance. The affiliate should ensure that the partner family is involved in meaningful construction work during all phases of the building process, even if such involvement slows the construction process or inconveniences site supervisors. HFHI strongly recommends that sweat equity hours be completed before occupancy and closing.

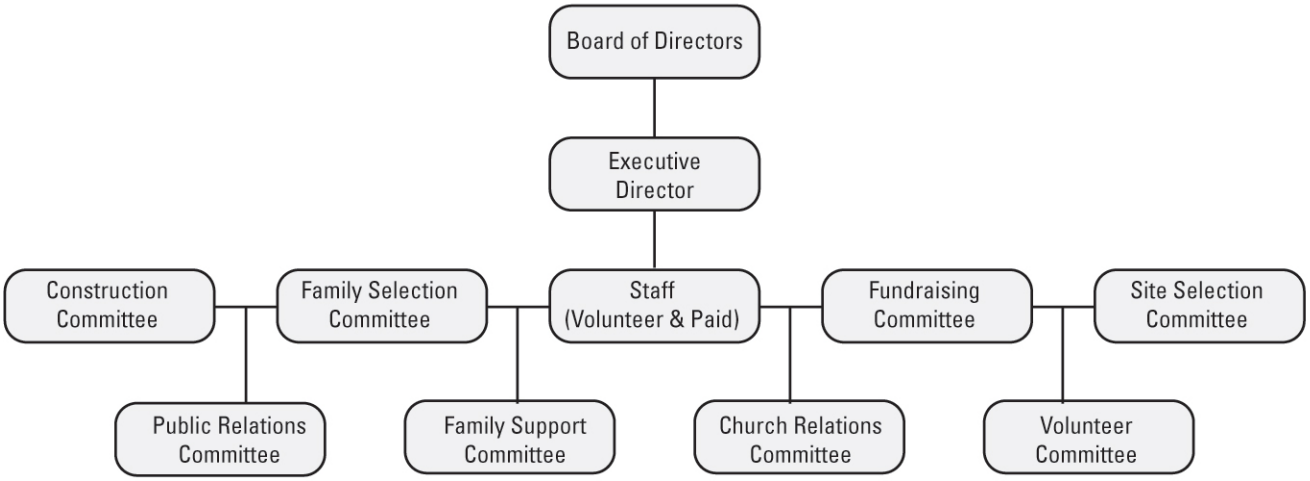
5. Setting up an effective construction team

Construction is one of the most critical functions of an affiliate, and is certainly the most visible. In order to successfully undertake and complete a construction project, the affiliate will need to assemble a full construction "team." The members of this team perform very different roles; some will serve in a strategic planning role, while others will be actively engaged at the construction site; some team members will be paid staff or outside professionals, while others will be volunteers.

This chapter discusses the various roles that are necessary for an effective construction team. Depending on the size and production level of the affiliate, many of these roles may be combined and performed by a single individual. An affiliate should not think that it is necessary to create a separate position for any of the roles described in this chapter.

Overall affiliate structure

Every affiliate should have a clearly organized structure. The following organizational chart is an example of the components of many affiliates and how they interact. In many instances, as staff grows, each committee has a staff member or board member counterpart.



Board of directors

All groups and individuals in the affiliate ultimately are held accountable to the board of directors. Board members define the affiliate's vision and, along with staff, communicate this vision to the general community as Habitat's official representatives. The board must also establish basic parameters for the affiliate's construction work, such as:

- Where to build.
- Whether to build on scattered sites, clustered sites or in larger subdivisions.
- Whether to build single-family or multifamily housing.
- Whether to engage in rehabilitation work in addition to traditional new construction work.
- Whether to adopt standards requiring that houses be built to an "Energy Star Plus" or higher energy-efficiency standard (e.g., LEED, NAHB, Earthcraft, etc.).

- How best to encourage sound construction practices and ongoing cost-containment measures.

Board members do not have to have experience in technical construction, have architectural or engineering backgrounds or be skilled craftsmen. However, board members should have a basic understanding of construction processes and general practices so they can effectively represent Habitat to the public and make sound decisions regarding the affiliate's construction activities.

Executive director

As relevant to the construction process, the executive director's responsibilities range from staff and volunteer supervision to coordination of communications between construction personnel and various suppliers, volunteers and inspectors. Executive directors must be well informed about the progress of each construction project. An executive director's level of involvement in details of construction depends upon the supporting staff and volunteers available.

Site selection committee

The site selection committee refines the vision developed by the board by defining the affiliate's focus area and working toward acquiring sites within it. This group:

- identifies potential sites;
- evaluates availability and general appropriateness of sites;
- in cooperation with the construction staff, evaluates the suitability of a site for the affiliate's inventory of basic house plans;
- oversees the evaluation of specific due diligence issues relating to the site (status of title, entitlements, environmental issues, crime rates, possible NIMBY ("Not In My Backyard") issues, proximity to family-related livelihoods [schools, jobs, transportation], etc.), develops and recommends a site acquisition policy for approval;
- implements the board-approved site acquisition policy;
- coordinates maintenance of acquired sites pending commencement of construction.

Site selection committee members should have a keen financial sense, knowledge of local real estate trends and practices, an understanding of real estate due diligence issues, an understanding of Habitat's "Sustainable Livelihoods Framework" and an ability to work with the public. The site selection committee works closely with the Construction committee and the construction manager.

NOTE: *All property considered by the affiliate should be processed through the site selection committee— even if a board member or the executive director first identifies the property. Due diligence procedures adopted by the site selection committee should always be observed. If the committee is not allowed to thoroughly investigate a site at the outset of negotiations, issues relating to title, environmental regulations, historic preservation requirements, zoning restrictions, NIMBY opposition, inability to obtain utility service, etc., may not be discovered until after the affiliate has invested significant time and money into the property or, worse yet, has taken title. Each of the foregoing cautions is equally applicable to property offered for donation – donated properties often have more challenges than "for sale" property.*

Construction committee

The construction committee:

- Develops the affiliate's inventory of standard house plans and manages all phases of construction;
- in collaboration with the family selection and family support committees, determines sweat equity requirements;
- develops the affiliate's own construction manual; helps identify and recruit long-term, volunteer site supervisors and crew leaders;
- plans training for site supervisors and crew leaders.

Members of the construction committee should include design and construction professionals, people with knowledge of building materials, practices and codes, and people skilled in the organization of labor and managing volunteers. The

construction committee works closely with the site selection, family selection and family support committees, as well as the volunteer coordinator. The construction committee reports to the board. Whether or not they are members of the construction committee, the affiliate's site supervisors and some crew leaders should be included in the construction committee's long term planning activities.

NOTE: *The site selection committee and the construction committee are equal partners in the Habitat construction process. It is crucial that the members of each committee work together closely and maintain clear channels of communication.*

The construction committee's responsibility is to develop standard house plans that meet Habitat's basic design criteria as well as local needs, codes and partner family size and income levels.

The site selection committee's responsibility is to locate property suitable for building that can accommodate the affiliate's approved house plans (and otherwise fits the affiliate's profile for site location), and is in a location that will allow a partner family to thrive. Affiliates also must be flexible, recognizing that there may be some circumstances when a standard house plan should be modified in order to fit an available lot. For additional guidance on modification of house plans, refer to Chapter 4 of this manual.

Whenever the construction committee is working on new or modified house plans, the site selection committee should be included in the process and should provide information about the affiliate's focus areas and the general characteristics of properties currently located within those areas.

Organization of construction responsibilities

Leadership roles for the construction process include:

- Construction committee chairperson
- Construction manager (sometimes called the construction "coordinator")
- Site supervisors (sometimes called "house leaders")
- Crew leaders
- Green building coordinator
- Materials and products coordinator
- Warehouse manager
- Volunteer coordinator
- Construction training coordinator

NOTE: *In smaller affiliates, one individual may fill several of these roles.*

Responsibilities for these roles are detailed below.

Construction committee chair

Habitat is much more than a nonprofit homebuilder. As a result, the chair of the construction committee should thoroughly understand and support the overall goals of the organization. An effective chairperson must not only have significant construction experience, but he or she must also be willing to meet with partner families and work with volunteers.

A good chair:

- Solicits those who are adequately familiar with the policies of Habitat for Humanity and have the skills needed to build a balanced team.
- Delegates responsibilities (building, volunteer coordination, design, cost estimating, procurement, training, etc.)
- Provides clear information on the committee's progress to the board.
- Understands and supports the mission and vision of Habitat for Humanity.

This role should not be confused with the day-to-day management provided by the construction manager. In a smaller affiliate with fewer activities, these tasks may be handled by the same person.

Construction manager (sometimes called a construction coordinator or director)

The construction manager must have professional construction and supervisory experience. Specific responsibilities include:

- Overseeing the entire building process at each building site, including materials procurement and coordination of subcontractors.
- Creating a construction schedule with the site supervisor for each project.
- Being available on a jobsite at various key times (e.g., when subcontractors are at work).
- Working with site supervisors throughout construction of a house.
- Attending construction committee meetings.
- Ensuring that each project is consistent with the mission and vision of HFH.

Site supervisors (sometimes called house leaders)

Each construction site must have a site supervisor. This person must work well with people and have good organizational skills.

Depending on the affiliate, there may be a number of site supervisors overseeing the construction of a particular house – one of whom will be on site each workday when volunteers are present. If multiple site supervisors are used, it is essential that the construction manager and each site supervisor communicate with each other regarding committed times and delegation of the responsibilities described below.

The site supervisor can be a Habitat volunteer and is responsible for:

- Overseeing construction at the site each workday when volunteers are present.
- Working with the volunteer coordinator and construction manager to identify and recruit potential crew leaders and other skilled workers.
- Scheduling each workday with appropriately sized crews.
- Serving as the primary contact for a project with the Habitat staff, specifically the construction manager.
- Attending construction committee meetings during the building of the project.
- Ensuring the safety of volunteers, and ensuring that the affiliate's safety policies are observed at all times.
- Understanding and supporting the mission and vision of HFH.
- Maintaining a site log for the site.

Site log: A site log is an ongoing daily diary of significant events during the project. It provides continuity of the progress on a site for all those in leadership positions. The log should note issues that arose during site visits, issues discussed during meetings, important phone calls and the number of volunteers present on site daily. The log should always be on site so any member of the affiliate can review notes on the progress of the project.

NOTE: Some smaller affiliates may not have crew leaders present on each workday. As a result, for many volunteers, the site supervisor may be the only Habitat representative that the volunteer meets and interacts with on site. It is essential that the site supervisor have strong people skills and be familiar with Habitat, its history and mission. It is equally important that the site supervisor be able to lead and direct volunteers through the workday.

Crew leaders

It is not possible for a site supervisor to oversee all ongoing construction activities at one time. As a result, each project should have one to four skilled persons (crew leaders) who can supervise each of the major tasks being conducted during a construction day (e.g., framing, roofing, etc.).

Crew leaders have six basic responsibilities:

1. Training – The crew leader must provide on-the-job training and supervision for semi-skilled and unskilled volunteers, exercising patience and respect for volunteers at all times. The crew leader must be able to answer specific questions about the tasks at hand, as well as general questions about house construction.
2. Tools – The crew leader must ensure that necessary tools are on the site for specific tasks.
3. Safe construction practices —The crew leader must train volunteers as to the proper use of equipment and other safe construction practices (e.g., climbing ladders). The crew leader must monitor observation of safety rules.
4. Personal health issues – The crew leader must establish and maintain a proper work pace, watch for signs of heat related issues, encourage adequate water intake, etc.
5. Ensuring quality construction — The crew leader should perform tasks that require a high level of skill. Crew leaders also should be able to quickly assess the abilities of volunteers and assign tasks accordingly. Crew leaders should stress to volunteers the importance of quality construction.
6. Maintaining Habitat's mission — In the performance of his or her duties, support the mission and vision of HFH.

NOTE: It is possible to build a house with unskilled volunteers, but not without skilled supervisors and crew leaders.

Green building coordinator

Habitat for Humanity International's U.S. Construction Standards recommend building to "Energy Star Plus" standards (i.e., Energy Star standards, plus a healthy indoor air quality standard). With respect to each project, the green building coordinator ensures that these standards are met or exceeded. Although basic building science is a core component of green building, the employment of other specialty practices and materials can make the house even more energy-efficient, safe and environmentally sustainable.

The green building coordinator should be well versed in sound building practices, as well as these other specialty areas, which include: optimal "sitting" of the house on the building lot (to maximize natural lighting), energy efficiency, indoor air quality enhancements, water conservation, landscaping, specialty products and specs, recycling of construction debris and waste material and efficient product ordering. Small and simple options which can be incorporated throughout the building process can have significant positive impacts on the environment as well as the energy efficiency of the house.

NOTE: For more information on "green building techniques, please contact the U.S. Support Center. You may also visit the U.S. Construction Web page on My.Habitat, which includes links to other Web pages with helpful information.

Materials coordinator

The materials coordinator works with the fundraising (or "development") committee's in-kind solicitation efforts by maintaining contact with national and regional HFHI suppliers, coordinating solicitation for current needs and selecting, and handling and storing donated materials. Part of the job of the materials coordinator is to review materials and products in order to determine appropriate energy-efficiency, health and durability features.

When soliciting in-kind donations, the materials coordinator should not make promises or representations regarding the tax deductibility of any item. The donor should always confirm these issues with his or her own tax adviser.

For many affiliates, the role of a materials coordinator is performed by the construction manager. Other affiliates assign several people to the task of seeking donated and discounted building materials. Still other affiliates have an entire committee devoted to this task. The materials coordinator is responsible for ensuring that this process is accomplished smoothly.

A materials coordinator must:

- Work closely with the construction manager and site supervisor to ensure that the proper materials are on site, on time.
- Be adept at residential construction practices.
- Understand how to solicit materials from the appropriate businesses or professionals.
- Have contacts in the construction industry.
- Have a thorough understanding of Habitat's commitment to partnership and the ability to communicate this commitment to construction professionals.
- Work with the affiliate's warehouse manager to see that suitable building materials are available.
- Under the direction of the construction manager, order bulk items that can be used on current and future projects.
- Under the direction of the construction manager, obtain bids for materials and services.
- Work as a liaison between the construction committee and the fundraising committee (or "development" committee).
- Understand and support the mission and vision of HFH.

Volunteer coordinator

In this role, good interpersonal skills are more essential than construction skills. The volunteer coordinator:

- Interacts with construction coordinators and supervisors to develop a schedule and define needs.
- Recruits volunteers.
- Creates a system for effectively managing the growing number of skilled and unskilled volunteers.
- Finds ways to promote competent volunteers into positions of leadership.
- Assigns or acts as an on-site volunteer host to welcome and sign in volunteers and answer non-construction questions.
- Understands and supports the mission and vision of HFH.

Warehouse manager

Affiliates with storage facilities must closely monitor the receipt and transfer of materials and equipment.

The warehouse manager must:

- Be familiar with building progress at project locations to ensure that necessary items are useful and available when needed.
- Maintain consistent and clear communication regarding deliveries with on-site construction personnel and the materials coordinator.
- Know the proper care of stored items.
- Maintain precise inventory control (an inventory system should be set up with the affiliate's accountant and finance committee).
- Understand and support the mission and vision of HFH.

Working with the professional community

Working with the professional community requires establishing and maintaining relationships with a variety of professionals.

Establishing relationships

The wide range of activities undertaken by a Habitat affiliate during the design and construction phases inevitably links the affiliate to various local professional groups. Developing and maintaining positive relationships with local building

professionals should always be an important goal of the affiliate. The first step is to communicate the work of Habitat and to provide a positive testimonial to the overall Habitat program by maintaining personable, but professional, relationships with the local business community.

The affiliate also should create an atmosphere where professionals (lawyers, architects, engineers, builders, surveyors, suppliers, etc.) want to provide materials or services at little or no cost. Important partnerships with professionals are an example of Habitat's theology of the hammer - the idea that diverse people with different skills are united by working toward the mission of decent, affordable housing for all.

Using professional services

Surveyors, architects, engineers and building scientists

Specific regulations and codes may sometimes require affiliates to use surveyors, architects or engineers.

A current survey is often necessary to clear title issues and to confirm that the completed house will comply with applicable zoning requirements. Tell the surveyor that Habitat is a nonprofit organization and that the surveyor should check with his or her tax adviser to determine whether donation of a survey can be a tax-deductible item.

Because of the simple, decent nature of Habitat houses and the availability of standardized Habitat house plans, Habitat houses may often be constructed without the need for an architect or engineer. Check with your local building department regarding procedures required for approval of building plans, including the circumstances under which an architect's and/or engineer's seal will be necessary (e.g., rehab projects and multi-family projects).

When an architect is engaged to design a Habitat house, the affiliate should use a written agreement specifying Habitat's house design criteria and the affiliate's expectations for the house. Architects must understand Habitat's emphasis on simple, decent housing and the need for Habitat houses to be affordable to low-income families.

Building scientists and green building specialists can improve the energy-efficiency, health and durability of Habitat houses. Green building specialists can help affiliate staff make decisions about the most cost-effective options in appliances, house systems and other sustainable building practices.

Realtors and lawyers

Real estate agents are a vital source of knowledge and experience in locating building lots. Often real estate agents, assisted by volunteers, are very effective in researching and tracking available property. Contact agents through realty associations in the area where you plan to build.

Always engage a lawyer to review construction related documents. Many pre-printed construction agreements are contractor biased – execution of a pre-printed form or contractor prepared form may lead to unexpected results relating to warranties, cost overages, unsatisfactory work, construction delays and on-site injuries. You may be able to find a lawyer who is willing to donate his or her services. It may also be beneficial for the lawyer to prepare a "standard" approved construction contract to be used by the affiliate on future projects.

Builders, contractors and subcontractors

The affiliate is the general contractor for construction. As such, the affiliate should require that subcontractors carry adequate levels of liability and workers compensation insurance and should request that subcontractors provide copies of their liability insurance and workmen's compensation certificate naming the affiliate as an additional insured to the construction coordinator.

NOTE: An affiliate can be held liable for injuries to a subcontractor if the individual subcontractor or his employer does not carry worker's compensation insurance. Affiliates also can be liable for injuries sustained by anyone on the worksite if the subcontractor does not carry liability insurance. For more information on affiliate construction liabilities, contact the U.S. Support Center.

Some construction phases require a skilled contractor. While volunteers are the backbone of our building process, a skilled tradesman can ensure efficient project work and quality in certain aspects of the building process. Local electrical, heating and plumbing unions are good sources of volunteer labor and materials, especially those with well-supervised apprenticeship programs. Some affiliates arrange to have skilled services performed by licensed professionals who volunteer on a rotating basis. Ask to speak at a union meeting, and post affiliate information in union halls.

NOTE: The following tasks often are subcontracted to construction professionals. These professionals may work for free or at reduced fees. And even if an affiliate must pay full price, using a professional for these tasks may be safer, more efficient and cost-effective in the long run than using unskilled or semi-skilled volunteers.

- Plumbing
- Electrical
- Drywall taping and finishing
- Mechanical/HVAC
- Masonry
- Cabinet installation
- Flooring
- Excavation
- Foundation installation
- Tile work
- Driveway and sidewalk installation

Material suppliers

Materials often are provided as in-kind donations (or sold at a discount) to Habitat for Humanity affiliates on a local level, or through HFHI on a national level. Local retailers, wholesalers and material distribution centers may also consider making donations to local affiliates. For more information regarding HFHI's Gift-in-Kind program, refer to Chapter 8 of this manual.

NOTE about donated materials: *At first glance, donated building materials may seem very appealing. Before accepting any donated materials, however, it is critical that the materials coordinator, construction manager or other qualified construction team members evaluate these materials for quality, energy efficiency and general appropriateness. Materials that do not meet the affiliate's minimum quality specifications should not be accepted. Thank the donor, but explain why the materials are not appropriate.*

Similarly, when donors wish to give items that go beyond simple, decent specifications (e.g., an oversized tub, bay window, specialty light fixture, etc.), the affiliate should be prepared to explain why it cannot use the item. Not only may such items necessitate expensive alterations to the basic house plan, they may also create unrealistic expectations for future Habitat families – high-end windows or floor coverings donated for one house may not be available for the next house. Also, since the dollar value of donated materials is factored into the house purchase price, a house with high-end components can become less affordable for Habitat's low-income partner families.

If a donor offers useable materials that do not meet your standards or specifications, you may want to consider accepting the items with the understanding that they will be resold by the affiliate to raise funds for the building program. Be sure the donor understands and approves of this resale before accepting the donation. For more information on Habitat "ReStores," refer to Chapter 8 of this manual.

Relationships with government agencies

House building requires designs, plans, specifications, permits, surveys, insurance and legal documentation. It may also involve planning and zoning hearings for variances and other approvals, as well as resolution of complex architectural or engineering issues. Most of these issues are reviewed by local governmental agencies or departments (e.g., the building department, zoning review board, local historic preservation commission, etc.).

A part of Habitat's work is to establish, maintain and strengthen relationships with various governmental authorities. The following suggestions may make working with local government officials easier:

- Make personal contacts with government officials. Do not be afraid to ask for advice or solutions to problems. An official may often be able to make introductions to other helpful resources.
- When a governmental official or staff member helps you in any way (even when just doing his or her job), express your appreciation. Thank the individual in person and, where appropriate, send a note (to the individual and his or her supervisor) and add the individual to your mailing list.
- Ask questions about the issuance of permits, and make notes for future use. Some local governments publish guidelines; others hold workshops. Record all information for future use. Find out if it is possible for the affiliate to receive a waiver or reduction of permit or impact fees, and what steps are required.
- Never assume that a building permit is not required, even if there is no evidence that a permit must be obtained. Some municipalities fine owners and builders for proceeding without necessary permits or insurance.
- Never attempt to bypass or ignore regulations, no matter how inappropriate the regulation may seem. Doing so is unethical and may have devastating effects on your future relationship with the governmental agency and your reputation in the community generally. Always remember that building codes provide for minimum standards only. In the case of energy codes, affiliates may often want to exceed such minimum requirements, opting for building practices that result in more energy-efficient, healthy and durable Habitat housing.

6. Project schedule, budget and tracking costs

As discussed in other chapters of this manual, the construction of a house requires a tremendous amount of planning and preparation. Among the most important preliminary steps are the preparation of the construction schedule and construction budget. The construction team will refer to these documents throughout the project and will make decisions based upon the information contained in these documents.

This chapter discusses each of these two key components of the project, as well as an important related component - the actual tracking of costs incurred by the affiliate for the house. To ensure that the house is sold on a no profit basis, it is essential that the affiliate adopts, and consistently follows, an accurate cost-tracking system. .

The project budget

An accurate project budget helps the affiliate to anticipate, document and manage house costs, and to better manage its cash flow. When preparing the budget, the construction team must assemble a clearly defined list of all out-of-pocket costs that are anticipated to construct the house – including both "soft" costs (permit fees, legal fees, etc.) and "hard" costs (materials, subcontracted labor, etc). This list should include each and every item for which a payment will be required.

As the house is being built, the costs should be tracked and reviewed on a regular basis (and never less frequently than monthly) by the construction manager or construction committee. It is also a useful practice for actual costs to be reviewed against the budget at the completion of each "phase" of the construction – for example, upon completion of site work, foundation work, framing, etc.

Any line item variances should be noted and examined to determine why the variance occurred, and whether there is an opportunity to use savings from another line item to cover the overage In addition and as discussed under the "Accounting, cost tracking and house pricing" topic of this chapter below, the affiliate should maintain a record of the value of gift-in-kind donations of materials, as well as donated professional and volunteer labor. Preparing and following a budget also helps the affiliate to better manage its cash flow.

The project schedule

Second only in importance to the project budget is the project schedule. When preparing a project schedule the construction manager should determine the following:

- Start date and length of time needed for site preparation work.
- The date of the first framing day.
- Daily tasks.
- Material needed each week.
- Number of volunteers needed for each workday.
- Dates on which subcontractors will work, and length of workday.
- Completion date.
- Family move-in date.

An accurate construction schedule enables an affiliate to:

- Predict how many volunteers are needed for each workday.
- Let volunteers know what is expected of them.

- Accurately schedule subcontractors. Subcontractors will respect the affiliate for scheduling them in advance and being ready for them on the specified date.
- Advise house sponsors of workdays and times and how many volunteers will be needed on each day.
- Readily integrate partner families in building their home.

The schedule should be determined by representatives of the construction, volunteer and development committees and approved by the executive director. If the construction committee prepares the schedule without input from the other committees, it may be difficult or impossible to effectively implement the schedule. The affiliate, as a whole, must "own" the schedule in order for it to be successful.

Keeping to a schedule will give volunteers and sponsors confidence in the affiliate and will ensure continued support.

Steps to creating a schedule are:

- Discuss the milestones that must be determined - start date, completion date and potential family move-in date.
- Determine volunteer needs for workdays (including house sponsor volunteers and construction supervision).
- Schedule material deliveries and subcontractors.
- Determine special event days (media days, house dedication, etc.)

Construction schedule example:

Assume that the affiliate adopts a 12-week construction schedule and decides to have the first framing day on Saturday, March 6. The following questions must be addressed by the construction manager:

What must happen before March 6?

The lot must be cleared, the foundation completed, and power and water brought to the site. Framing materials must be ordered and subcontractors scheduled.

How many volunteers are needed for each workday?

The construction manager must work with the volunteer coordinator, partner family representative and the house sponsor to determine who will fill the available volunteer slots. Crew leaders should be consulted regarding the appropriate number of volunteers for each workday.

What materials must be on site by what date?

Identify all items that must be ordered in advance and determine when deliveries need to take place.

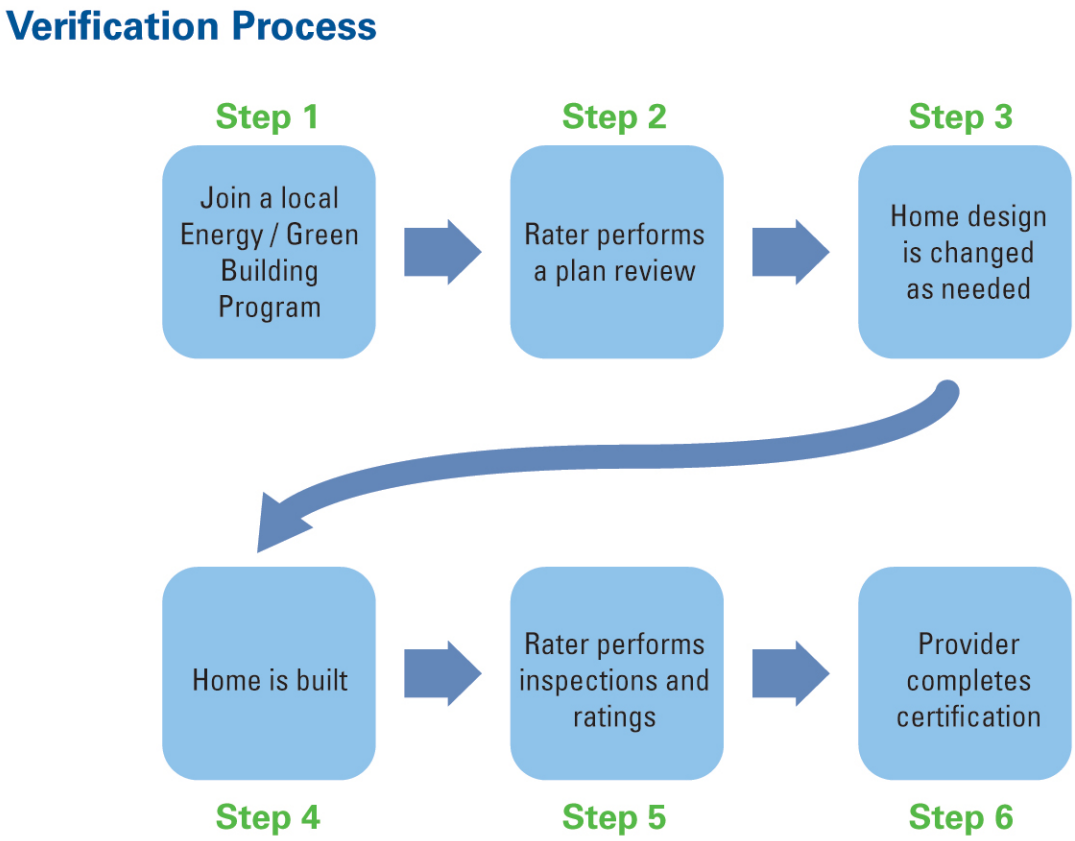
When is the house dedication?

It is best to select a date when the volunteers, house sponsor and family can come together for the house dedication.

NOTE: Habitat for Humanity International strongly recommends that partner families not be allowed to move in to the completed home prior to the house dedication ceremony and the formal closing, including 100 percent completion of the family's sweat equity commitment. For an additional discussion of the issues surrounding closing and occupancy, see Section 3, Chapter 3 of the Affiliate Operating Manual: Family Support.

Planning for Energy Star and Green Building certifications

In order for the house to receive an Energy Star or other Green Building certification, it is typically necessary for the house to be inspected at various stages of completion. It will be necessary for the construction schedule to incorporate these inspections. To ensure that it understands all inspection requirements, the affiliate should coordinate with a representative of the rating program before construction starts. The following diagram outlines the general verification process.



Planning for final house inspections

The construction schedule must also accommodate two critical inspections to be conducted at house completion with a partner family representative by the site supervisor or other appropriate affiliate representative:

Instructional inspection

The affiliate should conduct a complete "walk-through" inspection of the house with the partner family for the sole purposes of explaining how the household equipment, appliances and other systems work. In addition to operating instructions, the affiliate representative should fully explain the importance of routine maintenance and care of household equipment and systems. A home maintenance checklist detailing the items that should be discussed during this inspection is a helpful tool for both the affiliate and the homeowner. In addition, the instructional inspection should include advice on the most energy-efficient manner in which to operate systems and appliances.

Punchlist inspection

The affiliate should conduct a joint "walk-through" inspection of the house with the partner family to check for defects and incomplete items, and to create a punchlist of items to be corrected or completed before the partner family accepts ownership and moves into the house. The punchlist form should list all components of the house. The homeowner either approves an item "as is" by initialing it, or indicates the action needed. The affiliate representative and the homeowner should agree on a timetable for making the required corrections and completions. Then, as items are corrected or completed, the homeowner should initial and date each item, indicating approval of the correction or completion. The completed punchlist should be kept in the affiliate's files.

The punchlist is an essential part of the home sale – it provides written evidence of the condition of the house at delivery, and of the homeowner's satisfaction with the condition of the house. The list also demonstrates the affiliate's efforts to identify and correct problems.

Adoption of a consistent project cost-tracking system

In order to ensure that homes produced by Habitat affiliates are sold on a no-profit basis, HFHI's House Pricing Policy (Policy 23) contains very specific provisions for the costs that can be included in the calculation of the house price. In order to ensure that these costs are accurately and consistently tracked, it is imperative for the affiliate to adopt and observe a consistent, repeatable cost-tracking system. This system should be in place before any money is spent on the project.

In addition to tracking direct construction costs for labor and materials paid for by the affiliate, it is necessary for the affiliate to track:

- the value of gift-in-kind material donations;
- the full value of materials purchased by the affiliate at a discount;
- the value of professional labor donated by individuals and firms (e.g., skilled trades, electrical, plumbing, etc.);
- "soft" costs, including legal, architectural and engineering fees; recording and platting fees; permit fees, etc.

Although the value of unskilled volunteer labor is not factored into the sale price of the house, there may be situations in which it is desirable for the affiliate to track the number of volunteer hours invested in a house (for example, for purposes of establishing "leverage" in a grant program).

7. Coordinating the volunteer and non-volunteer workforce

The proper use, organization and management of the construction workforce can be one of the most difficult components of the construction process. Problems on a construction project can result from misconceptions regarding the roles of partner families, volunteers and paid professionals. The executive director, volunteer coordinator, construction manager and anyone else involved with volunteers must work together to make sure this part of the building process is effectively planned and managed.

This chapter briefly describes both the volunteer and non-volunteer members of the work force, but its primary focuses on effective training, use and management of construction volunteers.

Defining the workforce

The construction workforce comprises paid professionals, partner families and volunteers and affiliate staff.

Paid professionals

It is frequently necessary for an affiliate to hire a paid subcontractor for tasks requiring a licensed professional (such as electrical and plumbing work) or for other tasks requiring a high skill level (such as cabinet installation, tile and vinyl flooring, bath tile work, driveway and sidewalk installation, etc.). In addition, it may be necessary for smaller affiliates to use a paid professional as a construction manager for a particular project.

In order to control house costs, the use of paid professionals should be limited to those situations where use of a paid professional is necessary to comply with local ordinances and as otherwise necessary for sound, safe construction. An affiliate should have a written agreement with all paid professionals and subcontractors. When using an outside construction manager, the affiliate should be clear that the construction manager is an independent contractor, and not an employee. All outside professionals and contractors should be required to have insurance coverage and provide a certificate naming the affiliate as an additional insured.

If it is necessary for an affiliate to use a paid construction manager, part of that person's role should be to train staff members or volunteers to assume the role of construction manager on future projects.

Partner families

Selected homeowner families are our partners and fellow volunteers. The construction process must be accomplished with the family members, and they should participate in as much of the construction process as possible.

Opportunities for partner family involvement can be limited by any number of factors – productivity and construction schedule concerns, implementation of new construction systems by the affiliate, projects that offer limited volunteer opportunities, etc. In spite of these challenges, the partner family's work on a house must remain a high priority of the affiliate. Habitat builds houses in partnership with its families, not for families. It is this distinction that makes Habitat different from other all other affordable housing organizations.

NOTE: *The affiliate should never leave members of a partner family or any other volunteers unaccompanied at the site. All volunteers should receive adequate instruction and supervision.*

Volunteers

An affiliate should not associate the term "volunteer" with a particular skill level. Construction volunteers come from all walks of life, and may include donors, members of the affiliate's board of directors and community leaders, as well as highly skilled workers. Regardless of their standing or skill level, volunteers are a vital part of the philosophy of the Christian partnership in Habitat's ministry.

The use of construction volunteers also engages the community in Habitat's mission and increases Habitat's influence and fundraising capacity within the community. As authors Leslie R. Crutchfield and Heather McLeod Grant outline in their book "Forces for Good," Habitat volunteers receive something in return: "They are connected, inspired, and transformed in the process of working for a cause." These benefits alone justify the use of volunteers on Habitat projects, regardless of their degree of productivity. Nevertheless, the affiliate should always strive to keep volunteers productive and to make their involvement meaningful. Engaged volunteers are more likely to continue helping – and to become more involved supporting Habitat on other levels as advocates or donors.

Although Habitat is most frequently associated with the use of unskilled volunteer labor, many local construction professionals also may be willing to donate their time. The affiliate should identify available sources of skilled volunteer labor, and solicit volunteers from these sources. Examples might include a local or national homebuilders' or remodelers' association, as well as carpenter, electrical and plumbing unions.

Quality construction

Habitat for Humanity builds low-cost houses, not cheap houses. It is imperative that each participant in the construction process, whether paid or volunteer, understands how important it is for Habitat homes to be well-built, energy-efficient, quality structures that will stand the test of time.

Habitat houses must meet all applicable safety and construction codes, and they must also be built to withstand local climate extremes. A Habitat homeowner has the same right as any other homeowner to expect that a new house will be free from defects and that all systems are in sound working order. To underscore the importance of quality construction, HFHI has published a comprehensive set of construction standards for U.S. houses. The standards can be found on the U.S. Construction pages on My.Habitat:

http://my.habitat.org/link/1752

Volunteers with little or no construction experience may not recognize when their work is unacceptable. Site supervisors, construction managers and construction coordinators must take care to constantly evaluate ongoing work and ensure that substandard workmanship (whether performed by volunteers or paid professionals) is corrected. To ensure that each volunteer's experience with a Habitat house is meaningful, it is equally important that unskilled volunteers successfully learn construction skills through the guidance and patience of skilled supervisors.

Site supervisors, construction managers, construction coordinators and trainers should stress quality as often as they stress safety, and each person who works on a Habitat house – whether paid or volunteer – should treat the house with at least the same degree of care and concern they would want for their own home.

Tips on working with Habitat volunteers

- The volunteer coordinator and the construction manager should work together to decide how many workers are needed each day. Although a few extra workers should be recruited to cover for "no shows," remember that having too many workers is just as detrimental as having too few.
- Try not to have too many workers early on and too few late in the process. Although the finishing touches can be time consuming and somewhat tedious, they are just as crucial to a quality project as framing and roofing. Emphasize the importance of the jobs done after drywall: trim, doors, painting, window treatments, cleaning, etc. When possible, try to shorten build schedules in order to keep volunteer excitement and interest levels high.
- A good supervisor knows answers to questions or where to find them, and should be on site whenever volunteers are working. Supervisors should concentrate on supporting volunteers, rather than doing jobs themselves.

- Try to give each volunteer a sense of accomplishment. If a volunteer is not really needed on a particular job, find something else for that person to do.
- If a majority of volunteers appear tired and unproductive toward the end of the day, stop work early to avoid possible injuries and sloppy work. This can be particularly important if the weather is very hot, cold, wet or windy.
- Volunteer coordinators for house sponsors play a crucial role. They must, however, understand that skilled workers may be needed for particular jobs (such as trim work, tile work, hanging cabinets, etc.). The coordinator must work with the construction manager as needed to permit skilled workers access to necessary portions of the worksite.
- Do not overwork your skilled volunteers – they may be less willing to return for future projects.
- Materials needed each day to complete assigned tasks must be available to ensure a positive successful experience by the volunteers.
- Site supervisors and crew leaders should take reasonable steps to ensure that each volunteer is capable of performing the specific tasks that he or she is undertaking.

NOTE: *Policy No. 21 of HFHI's U.S. Affiliated Organization Policy Handbook provides restrictions for youth involvement on worksites based on safety considerations and federal child labor law requirements. In general, (a) no one under the age of 16 is allowed on a construction site while construction is ongoing and (b) no one under the age of 18 should be allowed to do any ultra-hazardous activities (which include the use of power tools or motor vehicles, demolition, roofing or working from a height of six feet or more, or excavation operations).*

The policy includes that, consistent with applicable federal regulations, 14- and 15-year-old children could be permitted to participate in painting or landscaping activities, provided that no construction is taking place and that adequate precautions are taken to ensure the safety of the worksite for such activities (e.g., all holes are covered, any tools and materials that could fall and cause injury are removed from the area of work, etc.). Under no circumstances should children under the age of 14 be permitted on the worksite.

The affiliate should ensure that all children under the age of 18 have permission from a parent or guardian to participate in the activity and that the parent or guardian has signed an appropriate Release and Waiver.

HFHI Policy does not currently contain limitations on the use of elderly volunteers on worksites. As is the case for all volunteers, however, site supervisors and crew leaders should take reasonable steps to ensure that volunteers are capable of performing the specific tasks they are undertaking.

How to schedule and train a volunteer construction crew

Although it is an advantage for an affiliate to have as many skilled volunteers as possible, thousands of Habitat homes have been built around the world by volunteers with no qualification beyond a desire to help. Through proper training, an affiliate can increase the number of skilled and semi-skilled workers available for ongoing and future projects.

Training techniques vary from affiliate to affiliate and by task. Training can be as simple as a morning orientation covering the tasks for the day – including required tools, quality expectations, crew assignments and safety issues. During the morning orientation and throughout the workday, it is important to stress to unskilled volunteers that skilled leaders (crew leaders and, when necessary, site supervisors) are available to assist them at any time. Under this type of system, the skilled volunteers function more as teachers than builders.

As an affiliate's house production level increases, it may move to a more sophisticated and regimented training curriculum. Unskilled volunteers and partner family members may be trained on certain tasks ahead of time so that that they are more productive when they arrive on the jobsite. In addition, volunteers interested in becoming regular crew leaders can be given specific training on a particular task, and crew leaders and other highly skilled volunteers can be trained to become site supervisors. This type of training often takes place off-site in a controlled environment such an as an affiliate warehouse.

When offering advanced training programs, it is extremely important to recruit volunteers who are willing to return regularly to work on Habitat projects. These training programs should also stress to volunteers the importance of fulfilling all work commitments. It is critical that a site supervisor or construction manager or construction crew be on the jobsite on all

agreed upon days. Developing and adhering to a clearly defined build schedule will reinforce the importance of these commitments.

Developing a build schedule

Developing and following a clearly defined build schedule – including specific tasks – is a critical part of managing volunteers. Outlining in advance tasks to be performed on any given day will not only help the volunteer coordinator to recruit the proper number of volunteers for each day, but also to recruit volunteers with the proper physical abilities for the day's work. For example, if the build schedule calls for raising roof trusses on a particular day, the volunteer coordinator can recruit volunteers who are comfortable working at heights or who are able to lift heavy objects. A reliable schedule also allows for the scheduling of trained crew leaders.

A detailed build schedule, publicized to prospective volunteers well in advance, allows volunteers to match their workdays with particular tasks that they feel comfortable with. A reliable schedule also allows for materials to be delivered to the worksite when needed, reducing the need for expensive storage space and the possibility of theft and ensuring that volunteers have the materials and tools necessary to make their Habitat experience positive and productive.

The length of the build schedule is not nearly as important as the affiliate's commitment to stay on schedule. Using unskilled volunteers should not be used as an excuse to deviate from the build schedule – delays associated with the use of unskilled volunteer labor should be built into the schedule. Predictability is possible on a Habitat project – the inability to keep to a build schedule is usually the result of poor project management, rather than heavy reliance on unskilled volunteer labor.

When establishing a schedule, it is important to form a consensus among the volunteer leaders, construction committee and administrative staff as to the amount of time it will take to complete each task. Experienced site supervisors and crew leaders should have a good idea how long specific tasks will take to complete with semi-skilled and unskilled volunteers. In other words, follow the basic tenets of project management, but let your skilled volunteers be a part of the planning.

For more information about construction scheduling, please visit the U.S. Construction site on My.Habitat: http://my.habitat.org/BusinessOperations/USConstruction

Volunteer burnout

Volunteer burnout is a common problem within Habitat affiliates. There is a natural tendency among affiliate staff to overuse skilled volunteers who are reliable, well-liked and effective. Skilled volunteers who are willing and able to act as site supervisors and crew leaders are essential to an affiliate's success. Great care should be taken to ensure that these volunteers are not overworked. Always be looking to recruit new volunteers to develop a deep pool of skilled volunteer labor so that no one person is asked to shoulder too much responsibility. Let your skilled volunteers know how important they are to your mission and thank them regularly for their contributions – both within the affiliate organization and publicly within the community.

Job descriptions on a single house build

A typical workday on a single house will require the following workers:

1 site supervisor

A site supervisor is sometimes called a house leader. On a multiple house build, there is a house leader for each house on each workday when volunteers or staff will be working. Note that, depending on the affiliate's size, there may be a different site supervisor on site on any given day.

- Site supervisors organize and manage the full construction team so that goals are met by the end of the day.
- Site supervisors list tasks needed to be accomplished that day and match crew leaders with crew members to do each task.
- Site supervisors are responsible for the day's schedule, job safety and maintaining the quality of workmanship.
- A site supervisor typically will not be present on site on a day when only subcontractors are working.

1-4 crew leaders

Crew leaders are typically assigned by task. If there are only one or two tasks to be completed on a single workday, only one or two crew leaders are needed for that day. There should, however, be sufficient crew leaders on site to provide necessary training and oversight for the day's work – taking into account the skill level required for such work.

- Each crew leader leads a group of general volunteer crew members in completing a specific task. Crew leaders are the teachers on the jobsite, so they need construction and teaching skills.
- Each crew leader is responsible for his or her crew only. If a crew leader observes issues with another crew, he or she should discuss the issue with that crew's leader, not the crew members.

12-20 general volunteer crew members

- Crew members are assigned to complete specific tasks throughout the workday in groups of four to six people. Depending on the difficulty of the task and the number of tasks ongoing each workday, the crew may or may not have an assigned crew leader guiding them.
- The general volunteer crew may be affiliated with a house sponsor or may be volunteering on an individual basis.
- It is important that volunteers (a) have a good time, (b) perform tasks correctly and (c) have a sense of accomplishment at the end of the day.
- A volunteer who has a positive experience may want to come back again. Repeat volunteers are a success for an affiliate – the more frequently a volunteer works with Habitat, the more experienced and valuable they become, and the more likely they are to become a crew leader or site supervisor one day.
- Don't forget your partner families. They are a resource for 200 hours or more. Train them well and use them as crew leaders when needed.

On-site volunteer host

It is recommended that, whenever possible, the affiliate have an on-site volunteer host, as this role enables the site supervisor and crew leaders to function more effectively. This person may be a representative of the house sponsor, or may be a volunteer or a member of the affiliate staff.

This person's job may include helping with sign-up before the build day. Primarily, however, this person is responsible for nurturing the volunteers during the build day and assisting with "non-technical" issues –general encouragement, ample water distribution, food coordination and any other non-construction issues. It's important that the expectations of this role are clearly explained, and training for this position is strongly encouraged.

- The host can handle non-construction matters, which allows the construction staff to remain focused on the work itself.
- The host should build a relationship with the crew leaders and crew members so they can schedule future workdays with them. (Crew leaders should be managed and their schedules set by the affiliate's construction manager.)
- The host can lead the "non-construction" portions of on-site volunteer orientation. The host should ensure that each volunteer signs a waiver.
- The host can promote other affiliate needs and issues that may involve recruitment to committees or advocacy or upcoming events the affiliate would like to promote.

Partner family representative

The partner family representative ensures that members of the partner family are on site each workday and should be able to answer any non-construction questions the family may have. The partner family representative also records sweat-equity hours.

Recognizing volunteers

Treat volunteers with decency and respect. They are Habitat's most precious resource. Volunteers are valuable friends and partners. Let them know how much their participation is needed and appreciated. Give them meaningful work and abundant thanks.

For more information on recruiting, managing and recognizing volunteers, visit the My.Habitat Knowledge Center:

http://my.habitat.org/kc/tags/Volunteer-Management

Explaining Habitat's true relationship with the partner family

In spite of the great degree of volunteer participation on Habitat projects throughout the country, many people – including many of those Habitat volunteers – remain uninformed about the Habitat "model" and the hard work and dedication of our partner families. The biggest misconception about the Habitat model is that houses are given away to our partner families. This misconception can interfere with the spirit of collaboration and true partnership between the on-site construction volunteers and members of the partner family, as they work alongside each other on the construction site.

During the morning orientation for each workday, the affiliate should consider taking five minutes to introduce the partner family to the volunteers and to talk a little bit about their lives – what they do for a living, where their kids go to school, hobbies, plans, etc., and also to summarize the partner family's "sweat-equity" contribution. The affiliate should reinforce in a respectful way that the house is not a "give away" – the partner family will buy the house from the affiliate and pay for it through a house note and mortgage. Partner families should be portrayed as excellent managers who have risen to the top of a highly competitive process and who have truly become the affiliate's "partner."

This brief "sensitivity training" can help volunteers gain a better appreciation of the partner family's dedication and the partnership between the affiliate and the family. Similarly, volunteers may be unfamiliar with the neighborhoods in which they build. Helping to point out the strengths of the neighborhood will not only help volunteers to feel a sense of community ownership, but also to make Habitat a respectful neighbor to families who live near the construction site. Cooperation and understanding yield benefits for all.

Home Builders Blitz: Maximizing relationships with local builders

Through its ongoing use of paid and volunteer building professionals, the affiliate is likely to establish a strong rapport with the local homebuilding community. Home Builders Blitz is a coordinated national program which encourages professional builders to partner with their local Habitat affiliate to build multiple Habitat homes over a short period of time.

The HBB program allows affiliates to increase their capacity by continuing with regular production schedules while professional home builders organize and execute the blitz build — doing what they do best — organizing their subcontractors and suppliers to completely build the houses.

The HBB model began in 2002, when HFH of Wake County (N.C.) and local custom home builder Tom Gipson partnered to recruit 12 professional home builders to build one house each in a five-day period, donating as much of the materials as possible. The results were astounding: 12 homes completed in five days at a total cost to the affiliate (not including land) of $84,000.

While local blitz builds with professionals can take place at any time, the Home Builders Blitz model has now become a national Habitat event that takes place every two years. The first two nationwide events took place in 2006 and 2008 and generated great publicity for Habitat, as 240 affiliates partnered with more than 2,000 building industry professionals to build 722 new homes. Visit the U.S. & Canada Home Builders Blitz site on My.Habitat for useful information:

http://my.habitat.org/Programs/USandCanadaHomeBuildersblitz

"This is the single-most impactful event our affiliate is involved in. It brings together the business brains, leverage and problem-solving skills of the most talented builders in our community for the good of Habitat. We gain more than just five homes from this event – we have gained loyal in-kind

supporters, board members, major donors and systems that work for us in the 'off years.'" – Kerry Thompson, Monroe County (Ind.) Habitat for Humanity

"It was amazing how quickly our vendors came to the table. I'd put the value of supplier/labor contributions at roughly $300,000. That doesn't even include the land! Three 1,600-square-foot townhomes built in just four days. It's pretty incredible." – Dave Guttman, Pulte Homes; partner with HFH Harford (Md.) for three Home Builders Blitz projects

For more information on the Home Builders Blitz program, visit the Home Builders Blitz site on My.Habitat or the public Web site at www.habitat.org/buildersblitz. To learn even more, contact HFHI's Building Industry Relations staff at (800) 422-4828, Ext. 7949, or e-mail homebuildersblitz@habitat.org.

8. Materials and tools

Building specifications

In order to build a house, the construction team needs two "levels" of instruction. The first level – the plans, elevations and related drawings – relates to the design and spatial organization of the structure. This level of instruction is discussed in Chapter 4 of this manual.

The second level – the building specifications – identifies the physical components necessary to create the house.

Developing the building specifications is a lengthy process involving a study of how the house will be built – from structural systems to finish materials. Many possibilities exist for any house, and can differ greatly in terms of price, energy efficiency and quality. The affiliate should research various available materials to identify those which are priced appropriately, and that will provide an acceptable level of quality and efficiency for the Habitat house. For example, single-pane glass or glazing should not be used when thermal break windows will ensure better insulation. Some affiliates have an architect reevaluate their specifications periodically to make certain that they remain appropriate and up-to-date.

For each piece of material and every system incorporated into the house, the affiliate must strike a balance among many factors in order to identify the single best choice. Next, the affiliate must evaluate the compatibility of items selected to make certain they will work properly together. Out of this somewhat tedious process comes a list of specifications that will create a cost-effective, energy-efficient Habitat house.

The construction committee should develop the affiliate's standard house specifications, which should be compatible with the affiliate's standard house plans. The specifications, along with the plans, create the basic house description. As noted above, the specifications should be periodically reevaluated to ensure that new construction materials and technologies are integrated when appropriate. These documents are then given to the construction manager to prepare for construction.

Materials list or take-off

The materials list, known in the construction industry as a take-off, is a list of the materials and the quantities needed to build the house to the plans and specifications. An accurate materials list helps the construction team know what material to solicit and helps create an accurate estimate of building costs. This estimate is much more reliable than a "guess-timated" square foot cost.

If the affiliate does not have a staff member or volunteer who is skilled in preparing a materials list, the affiliate should contact a local supply house. Most major suppliers have staff trained in preparing take-offs and, in anticipation of supplying the actual material orders, typically provide this service without charge. The affiliate may also consider a computer software package designed to create a take-off based on the house plans and specifications. Once completed, the take-off is given to the materials coordinator for review and processing of orders.

Soliciting materials

Soliciting building materials, services and equipment for a Habitat house is very demanding and requires creativity and dedication. In identifying sources of building materials, two different goals are pursued simultaneously. Initially, the affiliate seeks the lowest possible price for each item of material needed on a house – which may include the possibility of a donation. However, the second and equally important goal is to establish long-term relationships with suppliers – whether on an item-by-item basis (such as a commitment to donate all windows the affiliate may need over a period of time) or on a supplier-by-supplier basis (such as an agreement to give the affiliate a 15 percent discount on all purchases). This two-pronged approach should result in long-term cost savings on building materials.

The materials coordinator and development committee members should work together and should also cultivate contacts in the local building community. An important first step is to survey local suppliers and determinate what opportunities may exist for donations, discounts and other services. A list of local suppliers should include information such as discount and

delivery policies, inventory, prices and other relevant services (such as free take-offs), along with notes about any special relationships the affiliate may have with a supplier.

Many affiliates become actively engaged in the local professional building community by joining their local Home Builders Association (HBA). This membership allows the affiliate access to many trade partners and suppliers in the community and establishes Habitat as a member of the professional building community, rather than a not-for-profit seeking giveaways. For more information on joining your local HBA, go the National Association of Home Builders (NAHB) Web site at: www.nahb.com.

After completing a general survey of local suppliers, the materials coordinator should specifically determine what services the affiliate can expect from each supplier. Details needed from each supplier include policies on a purchase account, contractor's discounts or bulk discounts, invoicing, delivery and return policies. The materials coordinator should emphasize that, although the affiliate uses a significant amount of volunteer labor, it is an experienced builder deserving the same professional courtesies that would be extended to any contractor. Do not do business with a supplier that views the affiliate as an "amateur" home-improvement customer.

If appropriate, the materials coordinator should also make it clear that the affiliate intends to build a high volume of houses and that, as a result, material costs must be controlled by seeking discounts and donations whenever possible. This factor encourages better service and invites the possibility of special discounts or partial or full donations.

When interacting with suppliers, have available information that clearly states the affiliate's fundraising goals and the **potential** benefit to donors. The affiliate should not make representations about the deductibility of specific donations, and instead should encourage donors to consult with their tax advisers on any applicable tax deductions.

NOTE: The materials coordinator and construction manager should compile a list of people who can purchase materials on Habitat accounts. In some cases, affiliates use account cards that staff members can carry to identify themselves as purchasers. Limit the number of people with this authority and closely monitor the situation to maintain control over individual project accounts.

Materials donations

When donations from a supplier, the public or a manufacturer are being considered, compare the quality and performance of the material against the standards in the specifications. Specifications often list a product by name followed by the words "or equivalent." This notation ensures that, for this particular item, an appropriate substitute can be incorporated without sacrificing the quality or energy efficiency of the house. Before agreeing to accept a donated substitute material, the materials coordinator should always discuss this substitution with the construction manager to make certain that he or she has no objection. The construction manager may place limitations on the substitute material's use, or may rule it out altogether.

All donated materials must still be accounted for in the house price. The sale price of the house is not reduced by the value of in-kind donations. A donation of materials is treated like a cash donation. [The value of unskilled volunteer labor, however, is not included in the house price]. See HFHI House Pricing Policy (Policy No. 23). House prices are kept low through better design and construction practices, together with the use of volunteer labor.

Donated items that cannot be used by the affiliate (improper size, quality, etc.) and other accumulated items can be auctioned or sold by the affiliate at a special affiliate event, or sold at the affiliate's ReStore (see "Habitat ReStores" section below). Before accepting an item that will be sold or auctioned, the affiliate should always ensure that the donor understands that the donation will be sold, rather than used on a Habitat house. The explanation is a simple one – by selling the items, the affiliate will be able to raise funds to buy the particular types of building materials that it typically uses. This arrangement allows the donor an opportunity to participate in a way that most benefits the affiliate and its partner families.

Prior to conducting an auction, the affiliate should always consult with its tax adviser to ensure compliance with IRS regulations.

Gifts-in-Kind program

HFHI has established partnerships with some of the most well known manufacturers of building products, and is pleased to offer its U.S. affiliates the opportunity to apply for and receive free products through the Gifts-In-Kind (GIK) program. To access partner and product information, go to the U.S. Gifts in Kind Web page on My.Habitat. This web site contains all information needed for an affiliate to apply for GIK products. Because the products offered are free, affiliates are able to reduce their overall building costs without compromising quality.

http://my.habitat.org/FundingSupport/US_GIK

In addition to discounted and donated products through corporate partnership, HFHI also accepts direct materials and tool donations. Donated materials and tools often are delivered to HFHI's Distribution Centers in Americus, Ga. For a current list of products available from the Distribution Centers, call (800) 422-5913, Ext. 7664, or e-mail gik@habitat.org. Information and ordering are also available through My.Habitat – just click on the "Store" tab.

Habitat ReStores

Many Habitat affiliates have begun operating used-material ReStores to augment their fundraising and to help the environment through use or reuse of salvageable building materials. A ReStore also gives affiliates a continual and permanent presence in the community.

Habitat ReStores sell used, discarded, obsolete, overstocked, salvaged and refurbished building materials. This type of operation is an excellent match with the Habitat mission, because it allows any homeowner to keep a home in decent repair at a reduced cost, while diverting products from landfills and extending their useful life.

ReStores require the talents of a skilled staff, supported by a crew of volunteers. Inventory is obtained through a variety of methods. ReStores typically operate pick-up services to retrieve donated items and also receive substantial donations of new products donated by manufacturers or retailers due to overstocks or because a product has been replaced. In addition, many ReStores operate "deconstruction" programs ranging from pre-demolition "cherry picking" of items to full-scale building salvage and deconstruction.

For more information on ReStores, please go to the U.S. ReStores Web page on My.Habitat:

http://my.habitat.org/Programs/USRestores

For specific ReStore questions, please e-mail: restore@habitat.org.

Pay promptly, thank donors

Affiliates must honor all commitments to materials suppliers and donors. The materials coordinator must ensure that payments are made on time and that donations are promptly acknowledged. Such professionalism helps build a strong foundation for long-term relationships and helps to solidify the affiliate's image in the community.

When an item is donated, it is the donor's responsibility to specify the value of the item. So that the donor has a receipt for tax purposes, however, the affiliate should always send a thank-you letter to the donor describing the items donated.

NOTE: Generally, affiliates should not indicate the dollar value of donated materials on the receipt or thank-you letter that the donor will use to document a charitable tax deduction. The donor will make the declaration of value. The affiliate, however, must factor the fair market value of donated building materials into the cost and selling price of the house. When accepting donated materials, an affiliate should consult its attorney or tax adviser to ensure compliance with IRS regulations.

Ask the donor at the time of the gift whether the gift may be publicly acknowledged – whether in the affiliate's newsletter, event program or specific site sign. Remember that not all donors want public recognition, so take care to honor any wish to remain anonymous. Also, ask the donor if you may add his or her name to the affiliate's mailing list. "Keeping in touch" with the donor may lead to the donor's greater involvement, perhaps in other areas of the affiliate's work.

When receiving donated products through a relationship established by HFHI, an affiliate must meet reporting requirements to allow proper accounting for donations at the national level. To learn more about these reporting requirements, go to the U.S. Gifts-In-Kind Web page on My.Habitat. In order for HFHI to maintain a positive relationship with national partners, it is essential that affiliates comply with these reporting requirements on an accurate and timely basis.

Delivery and warehousing

Proper materials handling, transport and storage are vital to controlling costs. A carefully prepared project schedule will ease the coordination of deliveries. In addition, secure and accessible warehouse space can significantly reduce the affiliate's material cost by allowing the affiliate to purchase material in bulk.

Always clarify arrangements for delivery when ordering large quantities of materials. Many supply houses include free delivery; others charge a flat rate or a rate related to the dollar value of the order. Know the supplier's policies. The materials coordinator may place the order, but the construction manager knows where and when deliveries should be made, and should make those arrangements. If a slightly larger order will secure free delivery, the materials coordinator may alter ordering policies to accommodate the larger order.

Warehouse space is a critical component of the affiliate's total building program, and can be acquired in many ways. Some affiliates have used creative options such as soliciting unused storage space in operational warehouses or converting unused buildings to warehouse space (e.g., former schools, factories, etc.). Warehouse space also may be used for foul-weather activities such as training volunteers – or doing small construction tasks such as staining cabinets or pre-building framing headers, trusses or wall sections.

Tools and equipment needs

Since proper tools and equipment are necessary for every construction project, the affiliate should adopt and maintain a policy regarding the acquisition, care and storage of these items.

Construction tools and equipment are costly. Smaller affiliates may ask their volunteers to provide certain of their own basic tools (e.g., hammers, tool belts, nail aprons, pry bars, boots and gloves), provided that they are in good condition. Larger affiliates typically furnish most tools, which they purchase or acquire by donation. According to House Pricing Policy No. 23, affiliates are permitted to incorporate into the cost of each house a pro-rated portion of the cost of tools used in the construction process. The affiliate should purchase or rent only those tools that cannot be provided in any other way or that can otherwise be justified economically or functionally. Before renting or purchasing any item of equipment, the affiliate should confirm that the item is necessary in order to build the house.

The affiliate should also maintain an adequate inventory of personal protective equipment (PPE), including hard hats, safety glasses, hearing protection, fall protection/lanyard sets and dust masks. Sufficient amounts of these items should always be maintained at the worksite. Site supervisors and crew leaders often provide their own tools at smaller affiliates. As an affiliate grows and hires construction staff buying tools for staff becomes more practical and efficient.

Power Tools

The operation of table saws and other power tools requires special skills. The crew leader should take care to assign a trained person to operate this type of tool.

Rental of tools and equipment

Certain costly or infrequently used items can be rented rather than purchased. Examples include backhoes and other heavy grading equipment, as well as cement mixers, scaffolding and chainsaws. When renting equipment, the affiliate should maximize the investment. For example, if the affiliate is renting equipment to clear and grade a site, it makes sense to also clear and grade nearby worksites even if they will not be used for some time. The affiliate must also take care to secure the rented equipment against theft.

Identification

All equipment and tools owned by the affiliate must be clearly identified as affiliate property. This practice reduces confusion on the jobsite and eases site cleanup at the end of the workday, and prevents unintentional theft.

A simple and effective way of marking tools is to select an identifying "Habitat" color and apply it generously to all items that belong to the affiliate. Select a bright color that is readily available in both cans and spray containers. However, before applying paint to an item, make certain that the paint will not harm the item or impede its use.

This “paint-marking” system is not unique to Habitat affiliates, so select a unique color. Consider using two colors or a stenciled design. Once a unique identification scheme has been developed, “register” it with local pawnshops and secondhand stores. This step may help the affiliate to relocate and reclaim any stolen items.

Maintenance, storage and proper use

Affiliates should develop a sound maintenance and storage policy for tools and equipment, as well as a system for teaching and reinforcing their proper use. Unskilled volunteers can be very hard on equipment.

Even small items can become costly if they must be continually replaced due to careless use. The affiliate should adopt a system in which site supervisors and crew leaders actively teach volunteers how to properly use and care for tools and equipment. The responsible use of tools and equipment should be constantly reinforced during the workday. This practice not only saves money, but also creates a safer work environment.

Maintenance and proper storage are also critical to extending the useful life of tools and equipment. No affiliate can constantly afford to replace tools that are damaged or destroyed by poor storage and maintenance. In addition, the affiliate must regularly inspect tools and equipment to ensure that they are safe and in proper working condition. To that end, the affiliate may want to consider finding warehouse space that can also accommodate a tool shop. This type of space makes it easier for the affiliate to implement a sound maintenance policy and to keep equipment within its control.

Some affiliates use a house design that includes a freestanding shed to be used by the partner family for storage of bicycles, yard tools and other durable items. If built before the house, this structure can also be used by the affiliate to provide on-site construction storage. If tools or materials are to be stored in the shed, it should be adequately secured at all times.

Repair and replacement

Each affiliate should carry repair and replacement insurance policy for its own tools and equipment.

9. Rehabilitation and housing preservation

When land costs escalate and buildable lots become increasingly scarce, the affiliate may want to consider rehabilitating older, existing homes as a way to serve more families in need. Although Habitat's building operations often involve new home construction, "rehabbing" an existing property can be a successful undertaking for the affiliate, with the possible added benefit of contributing to the revitalization and stabilization of a neighborhood. In addition, if planned and implemented carefully, a rehab project can be less expensive for the affiliate, enabling an affiliate to serve more families with the same amount of funds.

In spite of the potential for positive results, undertaking a rehab project – particularly for the inexperienced affiliate – can have serious negative consequences, not the least of which is spending more money than anticipated. As detailed in this chapter, in addition to the obvious risk of overspending on the project, the affiliate can be exposed to potential legal liability relating to lead paint and asbestos removal. The affiliate may also have trouble finding a sponsor for a rehab project, particularly because of sometimes limited opportunities for volunteers. Finally, even if the project itself is a complete success, the rehabbed property may be located in a blighted neighborhood that is simply too undesirable for a family.

Due to these serious risks, this chapter will focus primarily on dealing with the potentially negative consequences of rehab projects.

This focus, however, does not mean that rehab projects cannot be successfully undertaken and completed by an affiliate. Many, many Habitat affiliates throughout the United States have developed very successful rehab programs. In fact, a few urban Habitat affiliates do more rehab work than new construction. The key to this success is careful planning and the use of both in-house and external experience and technical skills.

The intent of this chapter is simply to ensure that – prior to undertaking a rehab project – the affiliate is fully educated on possible risks. The affiliate must approach the project with its eyes wide open, and be willing to walk away prior to purchase if a possible rehab is too costly or risky, or is otherwise inconsistent with Habitat's mission.

Rehabilitation challenges

Due diligence

Physical: A thorough "due diligence" review is the most critical component of the rehab process. Failure to carefully screen a property can have a devastating impact on cost. What may initially look like a simple or moderate rehabilitation project could turn into a complete gut rehab or tear-down if the property is not properly screened. When determining whether or not to purchase an existing home, the affiliate should always use an experienced home inspector.

In addition, when evaluating older properties, affiliates should identify environmental hazards such as lead paint, mold and asbestos. Trained environmental inspectors should be used to identify potentially hazardous materials and to evaluate the cost to remove and dispose of such materials. Even if the house is to be completely demolished (rather than rehabbed), environmental laws may require that toxic materials be properly removed and disposed of, which can be very costly.

Site: Investigation of neighborhood conditions is just as important as inspection of the house itself, particularly for abandoned and foreclosed properties. Why did the prior owner or occupant walk away? High crime rates, poor schools and inadequate access to public transportation and essential services are just a few reasons that neighborhoods fall into decline. Absent careful site selection, the affiliate could end up with a house that no Habitat family will accept. The affiliate will then be forced to incur significant carrying costs (maintenance, property taxes, etc.) until the house can be sold.

Although this may not always be practical, it is preferable for the affiliate to have located a partner family for a particular house before closing. Lining up a family before site acquisition avoids problems associated with acquiring a property in a neighborhood where families may be unwilling to relocate.

NOTE: "Clustering" rehab projects can be beneficial for the affiliate for a variety of reasons. Having a critical mass of Habitat families within a neighborhood (particularly a neighborhood in need of revitalization) can be beneficial for the partner families. Also, if the housing stock within an area is of similar era and condition, lessons learned from the early projects can be applied to later projects.

Title: Deep discount houses may be available due to tax sale, mortgage foreclosure or abandonment and, by their nature, may be at higher risk for title issues. Affiliates should ensure that they have a process in place to fully examine and, if necessary, clear title before acquisition. The affiliate should always have the current status of title reviewed by a real estate attorney. If the affiliate proceeds with a purchase, a title insurance policy should be purchased.

ALERT: If your affiliate is offered the donation of an existing house, do not lose sight of the above issues. Even a donated house may prove to be too expensive or risky to rehab.

Estimating rehabilitation costs

It is critical to accurately project and understand the costs associated with a rehabilitation project.. Rehabilitation costs vastly differ depending on the nature of the project and extent of rehabilitation required. Certain additional categories of cost for rehabilitation are not encountered with new construction:

- Hazard abatement (mold, asbestos, lead, etc.).
- Labor – a higher degree of skilled labor may be necessary for many rehab projects.
- Demolition costs.
- Waste removal and disposal.
- Retrofitting for code and ADA compliance.

Costs for each of these areas should be carefully and accurately estimated before the affiliate purchases the property.

Even the most careful house inspection may fail to uncover issues hidden within walls, such as termite damage, wood rot, unexpected pipe locations and similar unexpected items. To ensure that funds are available to address these types of issues, the affiliate may want to consider adding a "contingency" line item to the overall rehab budget – perhaps 10%.

In the area of cost control and cost management, the most successful affiliates have found partners to offset costs associated with rehabilitation activity. Many opportunities for partnerships may exist, including gifts in-kind of skilled labor, such as house inspections or lead and asbestos remediation. In addition, to stabilize blighted neighborhoods, local jurisdictions may be more willing to waive building permit and waste disposal fees for rehab projects in blighted areas.

In addition to specialty and skilled areas, house rehabs can simply require more overall labor than a new construction project. The affiliate will need to determine when to use outside contracted labor, and when to use volunteer labor. An affiliate's decision to use volunteer labor for significant demolition work should only be undertaken after consulting the affiliate's liability insurance agent.

NOTE: Retrofitting an older house to comply with current codes can be a difficult process, and may sometimes be at odds with historic preservation standards. In order to address these challenges as they arise, it is critical for the affiliate to maintain a good working relationship with local code compliance officers and governmental officials.

Liability risks

Rehab projects may carry greater liability exposure risks than new construction projects.

Volunteer safety is paramount to any Habitat project. Particular risks associated with rehab projects may include:

Asbestos – Before 1976 , asbestos was commonly used as a fire-retardant and as a flooring and insulation component. If asbestos is present (or suspected to be present) in the house, it will be necessary for the affected material to be removed and disposed of by a licensed asbestos remediation company. Under no circumstances should staff or volunteers disturb asbestos.

Lead – If the house was built before 1978, the odds are good that it contains lead-based paint. Prior to then, lead was used extensively as a binder for paint. Homes built before 1960 are especially likely to contain heavily leaded paint. Due to health concerns, special care must be taken with dealing with lead-based products. Although volunteers can be trained to deal with the presence of lead, it is preferable to use a licensed contractor to remove and dispose of any material containing lead.

Age – Older houses may have structural issues that can make demolition more dangerous.

As a result of these and other risks, the affiliate should always secure a liability waiver from volunteers. In addition, it is strongly recommended that abatement work for hazardous substances be completed before volunteers are permitted to enter the home.

ALERT: Before beginning a rehab project, the affiliate should review the proposed activities (especially the extent to which unskilled volunteers will be used) with its insurance agent to make certain that proper coverage is in effect.

Volunteer labor/house sponsorships

As a result of the additional liability risks noted above, it can be difficult to incorporate a significant amount of volunteer labor into the project. House sponsors may be less willing to sponsor a rehab project than new construction.

NOTE: Housing stock "preservation" is an increasingly popular option in the housing industry. It may be easier to attract a house sponsor to a rehab project by pitching the project as a "preservation" project, or as an effort to save or revitalize an older neighborhood that has fallen into decline.

Demolition

Note that a decision to demolish, rather than rehab, the structure, does not eliminate all of the concerns above. The site of the property, as well as the condition of title, will not be resolved by demolition. Nor will demolition alleviate the need to properly remove and dispose of hazardous materials such as asbestos and lead. Before making a decision to demolish a house, the affiliate should confirm that the demolition would be permitted under applicable ordinances. The cost of demolition, including any environmental removal and disposal work, must be factored into the overall cost of the completed house.

Suggested steps for rehab projects

In spite of the many warnings above, it is absolutely possible for an affiliate to successfully undertake and complete a rehab project.

The benefits of completing a rehab project can include:

- Completion of the project for less than the cost of new construction.
- Contribution to the revitalization of a blighted neighborhood.
- Federal funding through the federal Neighborhood Stabilization Program.

Many affiliates have incorporated rehab projects into their ongoing programs, and a few affiliates do almost exclusively rehab work. And as a result of the foreclosure crisis and federal funding through the Neighborhood Stabilization Program ("NSP"), many more affiliates are expected to get involved in rehabilitation work on a regular basis

HFHI maintains an active list of affiliates that regularly conduct rehab work. Before its first rehab project, HFHI suggests that the affiliate consult one of these experienced affiliates, preferably of a similar size affiliate located in the same climate zone. This "mentor" affiliate may be able to offer assistance on general issues such as how best to engage volunteers,

how to find potential rehab properties and rules of thumb on when to "walk away" from a possible purchase. Contact the U.S. Support Center for help identifying a "mentor" affiliate.

If, after this initial coaching, the affiliate elects to pursue a rehab project, it should successfully complete each of the following steps prior to taking title to the property:

1. Complete a proper inspection of the proposed site and structure. Be honest in the assessment.
   - Will the site be acceptable to a partner family?
   - Is the house structurally sound?
   - What is the condition of the foundation?
   - Are adequate utilities available? Will they need to be upgraded?
   - What hidden problems could you likely encounter during demolition?
   - Will demolition be minor or is it a major part of the project?
   - Is the house located in a historic or other protected zoning district?
   - Are there special code requirements applicable to rehab work on this project?
   - How likely is it that environmental remediation work will be necessary?
   - Will the rehab project involve unacceptable risks, or risks for which the affiliate does not have insurance?
   - Once renovated, will the house be energy-efficient, safe and affordable to live in?
2. Factoring in all of the inspection results, determine the estimated cost of the completed project. Again, be honest in the assessment.
   - Have you identified all materials and subcontractors (including skilled environmental remediation subcontractors) which will be needed?
   - Have you accurately budgeted for these costs?
   - Have you built in an acceptable buffer for unforeseen costs?
   - Will the total cost be cheaper than building a new house?
3. Confirm that the affiliate can obtain good title to the property, and a title insurance policy at closing.
4. Identify resources that will be needed to complete the project. Funding, tools, trained inspectors (general and environmental), remediation contractors, demolition contractors, other subcontractors, trained volunteers, utility companies, government officials, etc.
5. Make certain that key members of the affiliate's construction team support undertaking a rehab project. The affiliate's first rehab project is likely to take twice as long to complete as a new Habitat house, and will require deviation from standard procedures. Certainly for the first few projects, all of this will place an extra burden on the construction team.

NOTE: When proceeding with a rehab project, the affiliate should consider the energy efficiency of the house and whether or not there are ways to improve energy efficiency during the course of the rehabilitation. The American Society of Interior Designers' Foundation and the U.S. Green Building Council have partnered to create the "Regreen" program, which focuses on best practice guidelines and targeted educational resources for sustainable residential rehabilitation projects. For more information, go to http://www.regreenprogram.org/

Finally, prior to undertaking any sort of concerted rehab program, it is critical that the affiliate have a clear commitment to partnering in community redevelopment work and that it is able to communicate that commitment to staff, volunteers and donors. Rehab projects are always dirtier than new construction projects, and often are more complex and expensive. The affiliate must be able to communicate its vision and commitment to each person involved in the process.

A Brush with Kindness

A Brush with Kindness is a Habitat program that mobilizes volunteers to provide exterior home maintenance assistance to low-income homeowners. Twin Cities Habitat for Humanity began A Brush with Kindness in 1998 in response to an overwhelming need in the Minneapolis/St. Paul area to help low-income homeowners who, because of age, disability or family circumstance, were unable to properly care for their home. The program continues to be a success in the Twin Cities, and the model has since been adopted by a number of affiliates throughout the country.

A Brush with Kindness addresses a critical and often overlooked need – after years of deferred maintenance, homes fall into disrepair. This can lead to a downward spiral: code citations, loss of homeowner insurance and, ultimately, mortgage foreclosure – that affects not just individual homeowners but entire neighborhoods. In most metropolitan areas, few housing programs help low-income homeowners with their housing maintenance issues .

Under the program model, homeowners are eligible to participate in A Brush with Kindness based on factors such as the condition of the home, income and a demonstration of challenging circumstances such as disability, illness or age that prevent them from doing the work by themselves. Qualifying homeowners contribute sweat equity by working side by side with volunteers to complete the work if they are able.

Volunteers perform 95 percent of all the work on the homes. Volunteers are recruited through businesses, churches and community groups. Volunteer teams of various sizes are matched with homeowners to work on and complete assigned tasks.

The goal of A Brush with Kindness is to serve families living in substandard housing by mobilizing volunteers in a meaningful community-building effort. As a result, homeowners have the opportunity to experience a stronger neighborhood and improve their quality of life. Volunteers have the opportunity to make a tangible difference in the lives of others as well as to build teamwork among co-workers, friends and family. Communities are often revitalized through the investment of time and resources in the refurbishment of these homes.

For more information on incorporating A Brush with Kindness into your operations, contacts HFHI's program representatives at abwk@habitat.org.

We would like to acknowledge the work of the Caterpillar Legal Services Division, Mossville, Ill., which prepared for one of our affiliates, on a pro-bono basis, an extensive written analysis of risks associated with rehabilitation work. Portions of that report were incorporated into this chapter with permission.

10. Glossary of Terms for Construction

A

Air infiltration – Uncontrolled inward air leakage through cracks in a building envelope. Outward leakage is called air exfiltration.

Accessible house – A house that can be approached, entered and used by individuals with physical disabilities.

ACH – Air Change rate per Hour (ACH), a measure of a home's air leakage rate. ACH estimates how many times in one hour the entire volume of air inside the building will leak to the outside.

Adaptable house – A house that is designed and built so that it can be readily converted to an "accessible" house.

Annual Fuel Utilization Efficiency -The annualized average efficiency of a fuel-fired appliance, taking into account the effect of on-off operation. The higher the AFUE the lower the operating costs.

B

Back Drafting – An occurrence in which combustion gases from a gas appliance enter the living space of a building instead of being drawn through a vent pipe and exiting a building.

Building code – Local regulations that control design, construction and materials used in construction.

Building envelope – Building elements (e.g., walls, roof, floors, windows, etc.) that enclose conditioned building spaces.

Building permit – Written approval to build a structure, issued on behalf of a city or county by its appropriate department.

Building specifications - (sometimes called "specs") - Detailed descriptions of materials and workmanship required in a structure.

C

Closing costs- expenses (over and above the price of the property) incurred by buyers and sellers in transferring ownership of a property. Also called "settlement costs."

Construction Manager - (sometimes called Construction Director or Construction Coordinator) - The affiliate staff member who is responsible for managing all of the affiliate's construction activities. The construction manager may serve other roles on the construction team. (This term is specific to Habitat for Humanity.)

Construction Specifications Institute - an organization that advances the standardization of construction language in building specifications. See www.csinet.org for more information.

Cool metal roof – A roof constructed with reflective roofing materials that have the ability to reduce cooling and heating energy use.

Crew Leader – A skilled person who handles on-site management of a particular task being conducted during a construction day. (This term is specific to Habitat for Humanity.)

D

Day lighting – An interior lighting technique which maximizes the use of natural light through the use of windows, skylights, solar tubes, etc.

Drawings – Documents showing in graphic or pictorial form the design, location and dimensions of the project.

E

Energy Recovery Ventilator (ERV) – An air-to-air heat exchanger or preconditioner, designed to reduce the energy required to heat or cool required outdoor air in mechanical ventilation systems by as much as 80%. These products exchange temperature and moisture properties from one airstream to another. The result is capturing the cooling or heating energy from the exhaust air before it leaves the building.

ENERGY STAR® – A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy designed to save money and protect the environment through implementation of energy-efficient products and practices in the home. Program requirements include a solid building assembly using highly insulated walls, sealed ducts, high efficiency windows, and third-party testing. These homes are at least 15 percent more energy-efficient than homes built to the 2004 International Residential Code (IRC).

ENERGY STAR® "Plus" – The basic Energy Star rating, with the addition of healthy indoor air quality measures. The use of "Plus" makes this term specific to Habitat for Humanity.

Environmental assessment – An assessment of a site (whether raw land or land with an existing structure) to determine whether there are any hidden environmental hazards such as asbestos, lead paint or contaminants in the soil or groundwater. The environmental assessment is conducted by a trained environmental consultant.

F

Finger-jointed studs – Short pieces of 2x dimensional lumber material glued together to form standard length studs. Finger-jointed studs are resource-efficient engineered materials, which are as strong as, but straighter and more stable than solid-sawn studs.

Fly ash – A fine, glass-like powder recovered from gases created by coal-fired power plants; an inexpensive replacement for some cement products that can also improve strength and segregation.

G

Geothermal Heating & Cooling – A type of alternative heating and cooling system that regulates internal building temperature through access to heat and cold stored beneath the earth's surface. The system circulates a water-based solution through buried loops in the ground, utilizing the nearly constant temperature of the earth. A geothermal system can result in 30-70 percent savings on heating and cooling bills.

Green Building – There is no industry standard definition for green building, but the term generally describes a type of construction which focuses on three interrelated goals: maximizing energy efficiency, maximizing indoor air quality and conserving natural resources. The terms "green" building and "sustainable" building are used somewhat interchangeably in the construction industry.

Green Building Coordinator – The affiliate staff member (who may serve other roles on the construction team) who is well versed in green building practices and ratings programs and is able to advise the construction manager as to establishing and reaching green building goals. [This term is specific to Habitat for Humanity].

H

HERS – Home Energy Rating System, which is a standardized system for rating the energy efficiency of a home. HERS is administered by RESNET (Residential Energy Services Network).

Heat Recovery Ventilator HRV (Air -to- Air Heat Exchangers) – Exhaust fan systems that warm the incoming air with heat from the outgoing air, recovering about 50-70 percent of the heat in the air. In hot climates, the function is reversed so that the cooler inside air passes by the incoming hot air and reduces its temperature.

HVAC – Heating, ventilation and air conditioning (cooling) system.

I

IAQ (indoor air quality) – The quality of interior air, in terms of content that could affect the health or comfort of building occupants. Building materials, paints, carpet/flooring and cleaning products can all negatively affect IAQ.

In-kind donations – Donations of building materials or labor to the affiliate to help reduce the cost of the house.

Insulated Concrete Forms (ICFs) – Insulated Concrete Forms are forms for poured concrete walls that stay in place as a permanent part of the wall assembly. The forms, made of foam insulation, are either pre-formed interlocking blocks or separate panels connected with plastic ties. This union allows concrete to perform as a thermally efficient building structure, creating very efficient "R" values.

L

LEED – Leadership in Energy and Environmental Design (LEED) is a voluntary rating system which is administered by the U.S. Green Building Council and a network of LEED providers. The LEED program encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria. LEED for Homes is the rating system used in the homebuilding industry. LEED for Homes has four levels of certification: LEED Certified, LEED Silver, LEED Gold and LEED Platinum (with LEED Platinum being the highest level).

Liability insurance – Insurance coverage that offers protection against claims alleging that a property owner's negligence or inappropriate action resulted in bodily injury or property damage to another party.

Lien – An encumbrance against title to a property which secures the payment of a debt or obligation. A lien may be granted voluntarily by the property owner (such as a mortgage) or be imposed involuntarily (such as a tax lien or judgment lien). Liens typically survive the sale of a property and, as a result, the purchaser should make certain that all liens are satisfied in full by payment at or prior to closing.

Low-E – Typically used as a reference to coating for high-performance windows, the "e" stands for emissivity or re-radiated heat flow. The thin metallic oxide coating increases the U-value of the window by reducing heat flow from a warmer air space to a colder glazing surface.

Low-flow plumbing fixtures – Plumbing fixtures that use significantly less water than conventional fixtures (while performing the same function).

Low VOC (Volatile Organic Compound) – Low VOC products have lower VOC emissions than standard products. [See definition for "Volatile Organic Compound" below].

M

MSDS – (Material Safety Data Sheet) - Information required from manufacturers listing hazardous material content of products, human exposure limits, and handling precautions.

Materials Coordinator – The affiliate staff member (who may serve other roles on the construction team) who (under the direction of the construction manager) is responsible for selecting, obtaining (whether by purchase or donation) and warehousing building materials. (This term is specific to Habitat for Humanity.)

Multifamily – A type of building (such as a condominium or apartment building) that will house more than one family. Contrast with "single family."

N

NAHB – National Association of Home Builders. Founded in 1942, NAHB is a federation of more than 800 state and local associations.

NSP – The Neighborhood Stabilization Program, a 2008 federal program that provides funding for the purchase of abandoned and foreclosed properties.

New construction – The building of a house from the foundation up. Contrast with a "rehab" project, which involves the rehabilitation of an existing building.

O

Off Gassing – Evaporation or chemical decomposition pursuant to which vapors are released from materials. Off gassing can be released by adhesives, paints, stains, carpet/flooring, furniture, etc.

Optimal Value Engineering (OVE) framing techniques – A practice that reduces the amount of wood required for framing without compromising structural integrity (e.g., placing wall studs at 24-inch intervals rather than the standard 16-inch interval).

OSHA –The Occupational Safety and Health Administration, a federal agency which is part of the United States Department of Labor. OSHA's mission is to prevent work-related injuries, illnesses, and deaths by issuing and enforcing rules (called standards) for workplace safety and health. OSHA's construction rules are published in its Construction Industry Digest and must be strictly observed by all affiliates.

P

Passive Solar Design – A house design technique that incorporates natural sunlight as a usable heat source. Passive solar elements include the strategic (a) placement and sizing of windows and overhangs; (b) placement (and preservation) of trees and (c) orientation of the house.

Photovoltaic or "PV" Panels – PV Panels generate electricity from sunlight using photocells. Cells within the panels react to sunlight and this reaction is captured to generate electricity.

Punchlist – A written list of items in a substantially completed house that are either incomplete or need correction. The punchlist is prepared by the affiliate and the partner family representative in a joint "walk-through" conducted at substantial completion of the house, but before move in.

R

R-Value – A measure of thermal resistance or the efficiency of insulation. The higher the R-Value number the greater the insulation value.

Raised-Heel Truss – A roof truss system (also called an 'energy truss") which is constructed so that the top member (rafter) is raised above the top of the wall, rather than resting on top of the wall. By allowing space for both the full depth of attic insulation and an air path from the soffit vent into the attic corners, this structure prevents ice damming and cold spots.

Rehabilitation (or "rehab") – The renovation of an existing building. Contrast with "new construction."

RESNET – The Residential Energy Services Network, a not-for-profit membership corporation which establishes standards for building energy rating systems.

ReStore – A retail store operated by a Habitat affiliate that sells discarded, obsolete, donated, overstocked, salvaged and refurbished building and household materials. [This term is specific to Habitat for Humanity].

S

Single-family construction – A house designed to be occupied by one family. Contrast with "multifamily."

Site log – With respect to each Habitat construction project, a daily diary of significant events that occur during the project. The site log is typically maintained by the site supervisors for the project. (This term is specific to Habitat for Humanity.)

Solar Water Heating system – Solar panels are placed on the roof; a water storage tank is stored inside the home, usually in the basement or utility room. The sun heats the water in the panels and the water is pumped to the storage tank.

Stormwater Run-Off / Non-Point Source Pollution - The remaining water, after a rainfall, that does not infiltrate back into the soil, but flows over the ground surface into storm sewers or waterways. This water carries pollutants from fertilizers, chemicals, debris and other sediment into lakes, rivers and streams.

Structural Insulated Panels (SIPs) – A type of building system combining exterior and interior sheathing, structural support and insulation into one modular factory-assembled unit, thus reducing the number of vertical joints, interior voids and assembly time. SIPs construction has provided buildings with great wind and seismic resistance, snow loading and

soundproofing characteristics. By eliminating a large portion of conventional wood framing, SIPs require less raw lumber in home construction.

Survey – A drawing, prepared by a licensed surveyor, showing the precise legal boundaries of a property and the location of improvements, easements, rights of way, encroachment and other physical features.

Sustainable Building – There is no industry standard definition for sustainable building, but the term generally describes a type of construction which focuses on three interrelated goals: maximizing energy efficiency, maximizing indoor air quality and conserving natural resources. The terms "green" building and "sustainable" building are used somewhat interchangeably in the construction industry.

Sweat Equity –The unpaid labor invested by partner families in the Habitat for Humanity ministry. These hours are a requirement of habitat homeownership. Sweat equity reduces the monetary cost of the house and increases the personal stake of family members in their home. Sweat equity fosters partnership with Habitat volunteers and staff. Sweat equity is a key principle of Habitat and is important in building partnerships across economic, racial and national divisions. (This term is specific to Habitat for Humanity.)

T

Take- off list – A list of materials and the quantities needed to build a house according to the final plans and specifications. Also known as a "materials list."

Title Examination or Search – An examination, conducted by a trained professional, of the public records of a particular county regarding the status of title to a particular property. From the purchaser's standpoint, the title examination will confirm who holds legal title to the property (and in what name), what customary liens will need to be satisfied at or prior to closing (for example, the seller's existing mortgage) and whether or not there are any other liens, claims or encumbrances that are unacceptable and that will need to be satisfied or removed at or prior to closing (for example, a judgment or tax lien).

U

U-Value / U-Factor – A measure of how well a building material conducts heat, most commonly used for rating windows. The lower the number, the better the insulating ability (i.e., the material is more resistant to heat transfer). The U-Factor is the reciprocal of the R-value. While building scientists will use R-values for measures of the resistance to heat flow for individual building materials, U-factor is always used as a summary measure for the conductive energy measure of building enclosures.

Universal Design – A building design which provides a certain minimum level of accessibility to a person with a physical disability. Features that provide complete accessibility can be added or altered later.

USGBC (U.S. Green Building Council) – A nonprofit organization dedicated to sustainable building design and construction, and to promoting buildings that are environmentally responsible, profitable and healthy places to live and work. USGBC administers the LEED rating system.

Urban Heat Island – Urban areas experience higher ambient temperatures caused by an abundance of pavement and concrete, non-reflective construction materials and little vegetation.

V

Visitable House – A house that includes design features that make it possible for persons with mobility limitations at least to enter (visit) the home and utilize the bathroom.

Volunteer Coordinator – The affiliate staff member who coordinates the use of unskilled volunteer labor on construction sites.

Volatile Organic Compounds (VOCs) – Volatile Organic Compounds are emitted as gases from certain solids or liquids and include a variety of chemicals, some of which have potentially dangerous health effects. Concentrations of VOCs are consistently higher indoors than outdoors. A wide range of products, including paints, stains, sealants, and cleaning

supplies, emit VOCs. Purchasing and using products with no or low VOC content is a favorable alternative to promotion of a healthy indoor environment.

X

Xeriscaping – Climate-tuned landscaping that minimizes outdoor water use while maintaining soil integrity and building aesthetics. The type of landscaping typically includes emphasis on native plantings, mulching, and no or limited drip/subsurface irrigation.

Z

Zero Energy House – Any house that, on an average yearly basis, consumes no energy. During periods of peak demand, a zero energy home supplies more energy than it consumes, typically using one or more solar energy strategies, energy storage and/or net metering. In a zero energy home, efficiencies in the building enclosure, HVAC systems, appliances and lighting fixtures are great enough that, on a net basis, no added energy is needed.

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